Functions

Indoor Unit

Operation ON/OFF by Remote controller

Sensing the Room Temperature

- Room temperature sensor. (Thermistor)
- Pipe temperature sensor. (Thermistor)

Room temperature control

- Maintain the room temperature in accordance with the Setting Temp.

Starting the Current Control

- Indoor fan is delayed for 5 sec at the starting.

Time Delay Safety Control

- Restarting is for approx. 2 minutes.

Indoor Fan Speed Control

- Super High, High, Med, Low

Operation indication Lamps (LED)

--- Lights up in operation

--- Lights up in Sleep Mode

--- Lights up in Timer Mode

--- Lights up in Defrost Mode (for Heating Model)

Soft Dry Operation Mode

- Intermittent operation of fan at low speed.

Sleep Mode Auto Control

- The fan is switched to low(Cooling), low(Heating) speed.
- The unit will be stopped after 1, 2, 3, 4, 5, 6, 7 hours.

Natural Air Control by CHAOS Logic

- The fan is switched to intermittent or irregular operation
- The fan speed is automatically switched from high to low speed.

Airflow Direction Control

- The louver can be set at the desired position or swing up and down automatically.

Defrost(Deice) control (Heating)

ƒU Both the indoor and outdoor fan stops during defrosting.

Hot-start Control (Heating)

ƒU The indoor fan stops until the evaporator pipe temperature will be reached at 28°C.

Outdoor Unit

Power relay control

- If power is on, it will operate to chage capacitor (330μF/450WV) on controller and power relay will operate after about 2~5sec.

Stand by control at low temp.

- If outdoor temp. is below 0°C, sump heater is operating for 20min.
- At the initial, It will be operated compressor after 1min. for preheating.

Active power filter control(PFC)

- The active power filter is designed to correct power factor(cos θ) and to regulate DC link voltage.
- It will be operated PFC circuit when the compressor freq. is over 12Hz.
- If DC link voltage is not over DC 350V in 6 sec. in case of PFC on, it does not operating of compressor.

Comp. Freq. control

- The final operating freq. of comp. is set the lowest freq. that limited outdoor temp., discharge pipe temp., heat-sink temp., target freq., owing to CT.

Overheatng. Protection(Powr module)

Freq. speed control(up/down speed)

V/F control

- It will be changed the drive voltage of comp. according to operating frequency.

Total current control (over current protechton)

DC peak current control

4 way valve control

- It is only operated in the heating operation mode except defrosting operation.

Outdoor fan motor control

- High speed
  -Although fan motor speed is low, it will change high speed in case of below AC193V, over 45°C of outdoor temp., and over fc, fh of comp. Freq.
- Low speed
  - Nomal mode and over AC270V

Discharge pipe temp. control

Remote Controller

Operation ON/OFF

Operation Mode Selection

(Heating model only)

Cooling Operation Mode.(❄) Auto Operation Mode.(A)

Healthy Dehumidification Operation Mode.(💧) Heating Operation Mode.(☼)

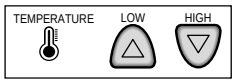
Fan Speed Selection

(Low) (Med) (High) (CHAOS)

Room, Temperature Display

: (High: 39°C ◄——► LOW : 11°C)

Temperature Setting

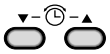


Cooling — Down to 18°C / Up to 30°C

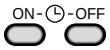
Heating — Down to 16°C / Up to 30°C

JET COOL

Setting the Time or Timer



Timer Selection



: OFF, ON, OFF ◄——► ON

Timer Setting

Timer Cancel

: Cancel Sleep Mode, Timer ON or Timer OFF

Sleep Operation

: 1, 2, 3, 4, 5, 6, 7, Off Timer

Airflow Direction Control

Fan Operation Mode

: Fan Operates without cooling or heating.

Reset

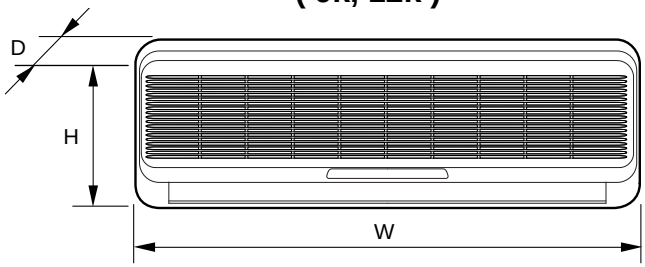
Product Specifications (Cooling & Heating)

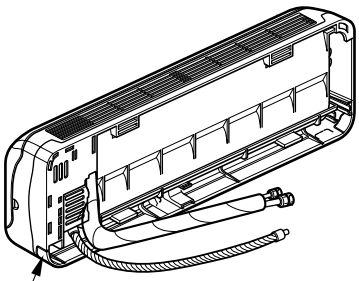
Item / Model Name		Unit	LS-J0961NL	LS-L1260NL	LS-J0961NT	LS-L1260NT
			at 230V		at 220V	
Cooling Capacity		Btu/h	9,000Btu/h(5,300~9,900)	12,000Btu/h(7,500~13,200)	2,650W(1,900~2,900)	3,515W(2,200~3,865)
Heating Capacity		W	11,600Btu/h(51,00~13,600)	15,400Btu/h(9,000~18,500)	3,400W(1,320~3,985)	4,600W(2,650~5,420)
Moisture Removal		*l*/h	1.2	1.5	1.2	1.5
Power Source		Ø, V, Hz	1Ø, 220-240V, 50Hz			
Air Circulation	Indoor	m^3/min	6.2	9.0	6.2	9.0
	Outdoor		25	25	25	25
Noise Level	Indoor	dB (A)¡ 3	35	37	35	37
	Outdoor		50	51	50	51
Input	Cooling	W	1,070(540~1,300)	1,280(760~1,750)	1,070(700~1,300)	1,280(760~1,750)
	Heating		1,300(500~1,630)	1,700(870~2,400)	1,300(500~1,630)	1,700(870~2,400)
Running Current	Cooling	A	4.8(3.2~5.8)	5.9(3.5~8.0)	5.0(3.3~6.0)	6.1(3.7~8.2)
	Heating		6.0(2.3~7.5)	7.8(3.9~11.0)	6.2(2.5~7.7)	8.0(4.2~11.5)
Motor Output	Indoor	W	5.7	12	5.7	12
	Outdoor		23.5	23.5	23.5	23.5
Dimensions (W¡ ¿H¡ ¿D)	Indoor	mm	802 x 262 x 165	900 x 280 x 178	802 x 262 x 165	900 x 280 x 178
	Outdoor		801 x 555 x 262			
Net. Weight	Indoor	kg	7	9	7	9
	Outdoor		35	42	35	42
Refrigerant (R22)		g	800	1100	800	1100
Airflow Direction Control (Up & Down)			O	O	O	O
Remocon Type			L.C.D Wireless			
Service Valve	Liquid	inch(mm)	1/4" (6.35)			
	Gas		1/2" (12.7)			
Sleeping Operation			O	O	O	O
Drain Hose			O	O	O	O
Connecting Cable			1.0mm^2	1.5mm^2	1.0mm^2	1.5mm^2
Power Cord			1.0mm^2	1.5mm^2	1.0mm^2	1.5mm^2

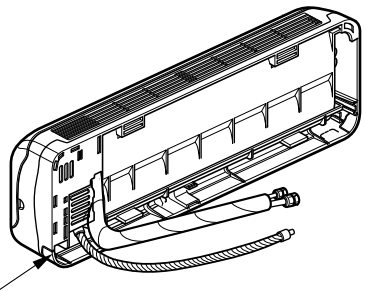
Dimensions

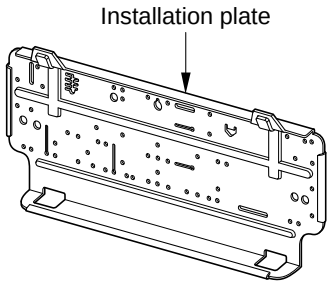
(1) Indoor Unit

(9k, 12k)









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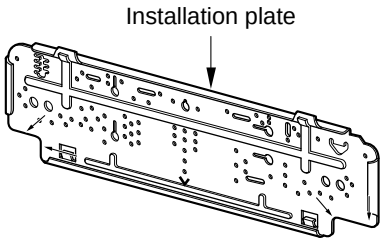

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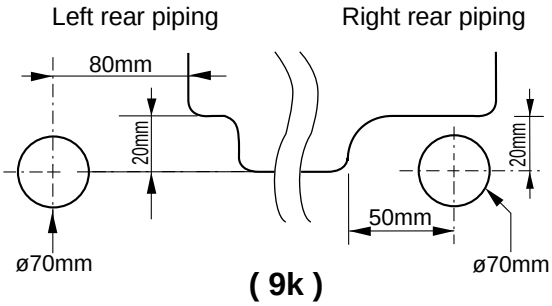
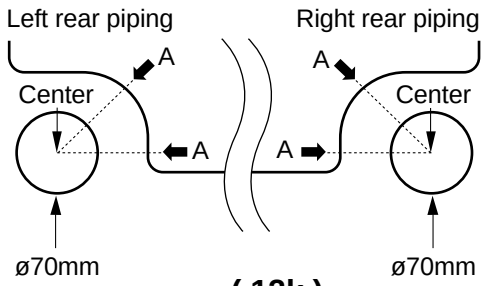


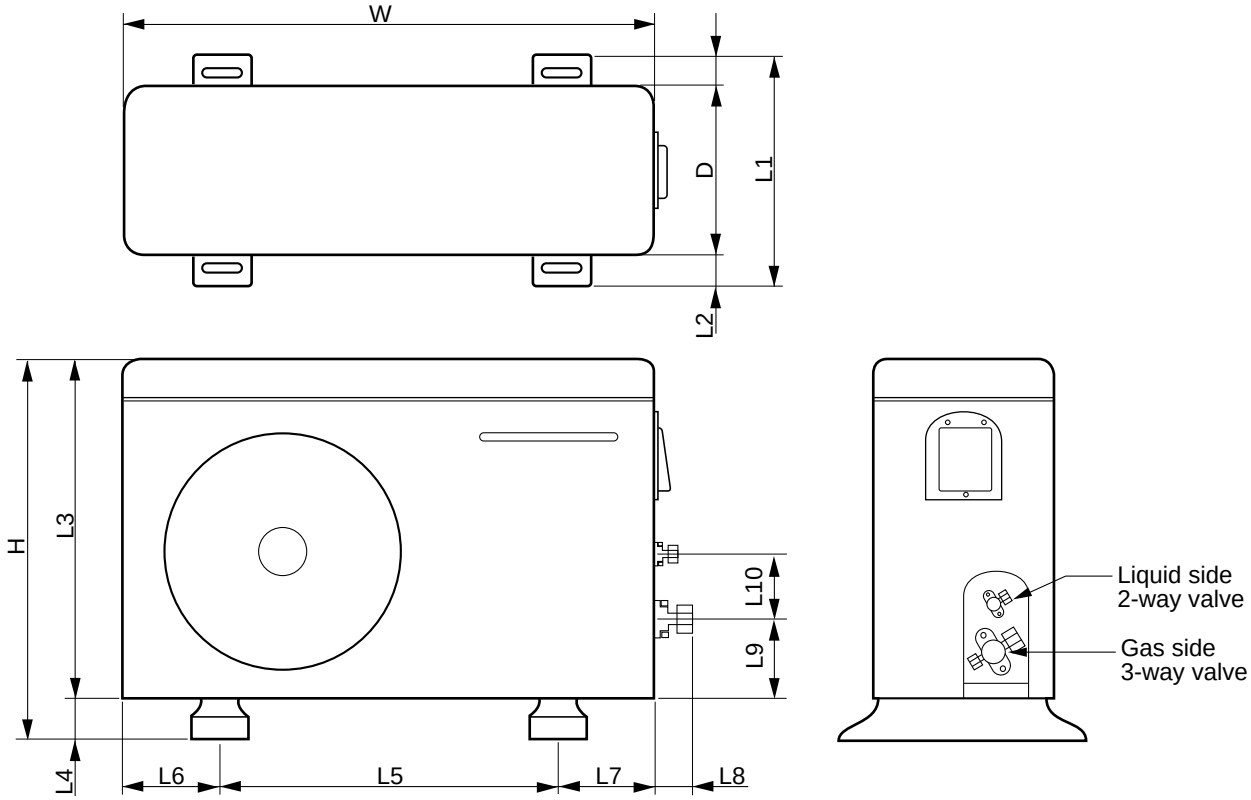
(9k)



(12k)

DIM \ MODEL / Unit		**7k, 9k Btu Series**	**12k Btu Series**
W	mm	802	900
H	mm	262	280
D	mm	165	178

(2) Outdoor Unit



DIM / MODEL unit		7k, 9k, 12k Btu/h Series
W	mm	801
H	mm	555
D	mm	262
L1	mm	339
L2	mm	37
L3	mm	543.6
L4	mm	11.4
L5	mm	591
L6	mm	105
L7	mm	105
L8	mm	72.5
L9	mm	86.4
L10	mm	77

Operation Details

1. LED display of indoor unit

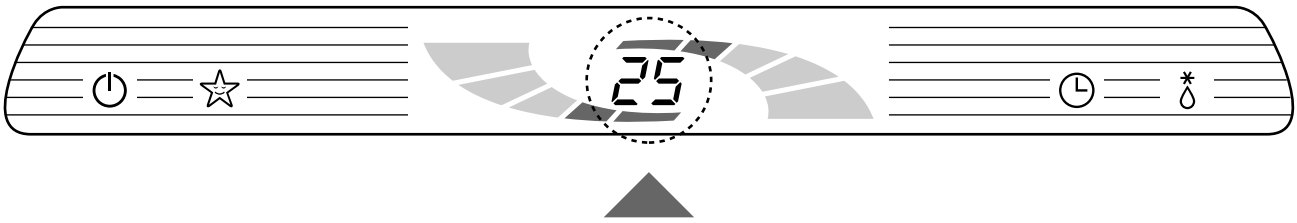
Operation Indicator
- On while in appliance operation, off while in appliance pause.
- Blinking(3sec off/0.5sec on) according to Error Code as long as the system malfunctions.

Sleep Timer Indicator
- On while in sleep timer mode, off when sleep timer cancel or appliance operation pause.

Timer Indicator
- On while in timer mode(on/off), off when timer mode is completed or canceled.

Defrost Indicator
- Off except when hot start during heating mode operation or while in defrost control.

Setting Temp.
- Cooling/heating/dehumidification mode : setting temperature from remote control
- Fuzzy operation mode : fuzzy key data(5sec on) → AI



Operation Indicator	Cooling heating dehumidification	A.I operation mode						Jet cool
		Standard	Too hot	Hot	Comfortable	Cold	Too cold	
Shape of display	Setting temp.	A1	-2	-1	0	1	2	Po

■ How to operate the power display

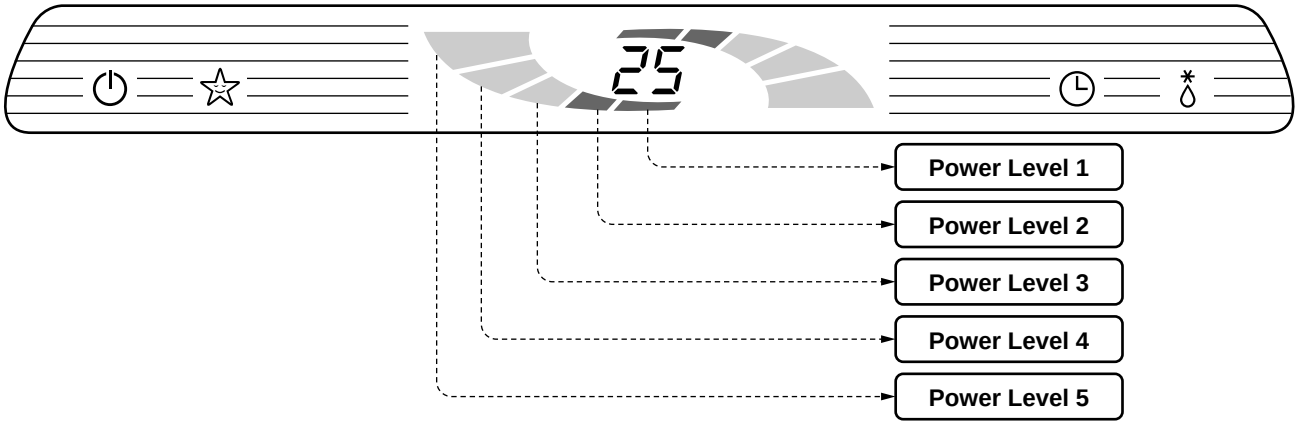
- It must be displayed the power level that will be operating frequency of compressor.
- It indicates power levels that compressor operating frequency is controlled to depend on indoor and outdoor conditions.
- It is displayed as below.

❒ Heat mode operation

- Power level 1: below ¤Øof COMP. operating frequency
- Power level 2: below ¤ of COMP. operating frequency
- Power level 3: below ¤ of COMP. operating frequency
- Power level 4: below ¤ of COMP. operating frequency
- Power level 5: over ¤ of COMP. operating frequency

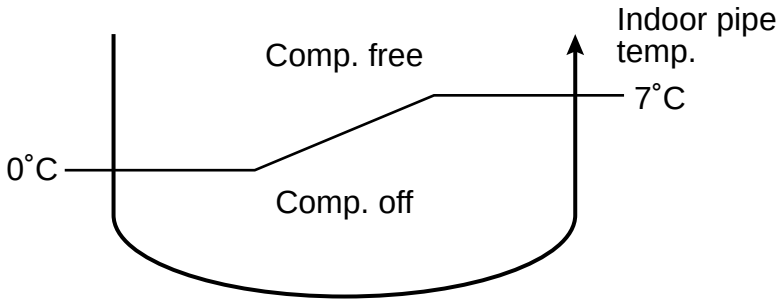
❒ Operation mode except heat mode operation

- Power level 1: below ¤Łof COMP. operating frequency
- Power level 2: below ¤ of COMP. operating frequency
- Power level 3: below ¤ of COMP. operating frequency
- Power level 4: below ¤ of COMP. operating frequency
- Power level 5: over ¤ of COMP. operating frequency



2. Protection of the evaporator pipe from frosting

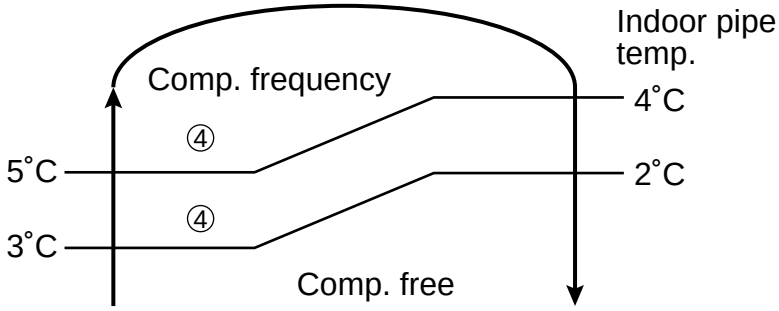
- If the indoor pipe temperaure is below 0°C in 7 min. after the compressor operates without pause while in cooling cycle operation mode,
  ➔ compressor, outdoor fan are turned off.
- When indoor pipe temp. is 7°C or higher after 2 min pause of compressor
  ➔ compressor, outdoor fan is turned on according to the condition of the room temperature.



3. Protection of the indoor fan from droplet formation (Enclosure sweat and condensed disposal test)

- **Control condition :** The system operates standard operation without this condition as follows.
  - Setting temperature <25°C
  - Indoor fan speed ≤ low speed
  - Outdoor temperature < 31°C

- **Control method**
  - Operation frequency of compressor must be below ④ **(refer to the comp. Freq. table)**
  - The indoor fan operates at medium speed.



4. Cooling mode operation

- Operating frequency of compressor depend on the difference of the temperature.
  (= intake air Temp.- Compressor off Temp.
- Compressor off temp.= setting temp. –0.5°C
  on temp. = setting temp. +0.5°C
- If compressor operates at some operating frequency, the operating frequency of compressor cannot be changed within 30 seconds.

- Condition of compressor turned off
  - When intake air temperature stay at the temperature between setting temp. –0.5°C and setting temp. –1.0°C for 3 minutes continuously.
  - When intake air temperature reaches below the temperature of setting temp. –1.0°C.

- Compressor 2 minutes delay
  - The compressor can restart minimum 2 minutes later after compressor off.

[The operating freq. step of comp.]

Temp. differences	Comp. Operating frequency
over 2.5°C	¤
2.0~2.49°C	¤
1.5~1.99°C	¤
1.0~1.49°C	¤Œ
0.5~0.99°C	¤Ł
0.0~0.49°C	¤

[The targeting operating freq. of comp. each model]

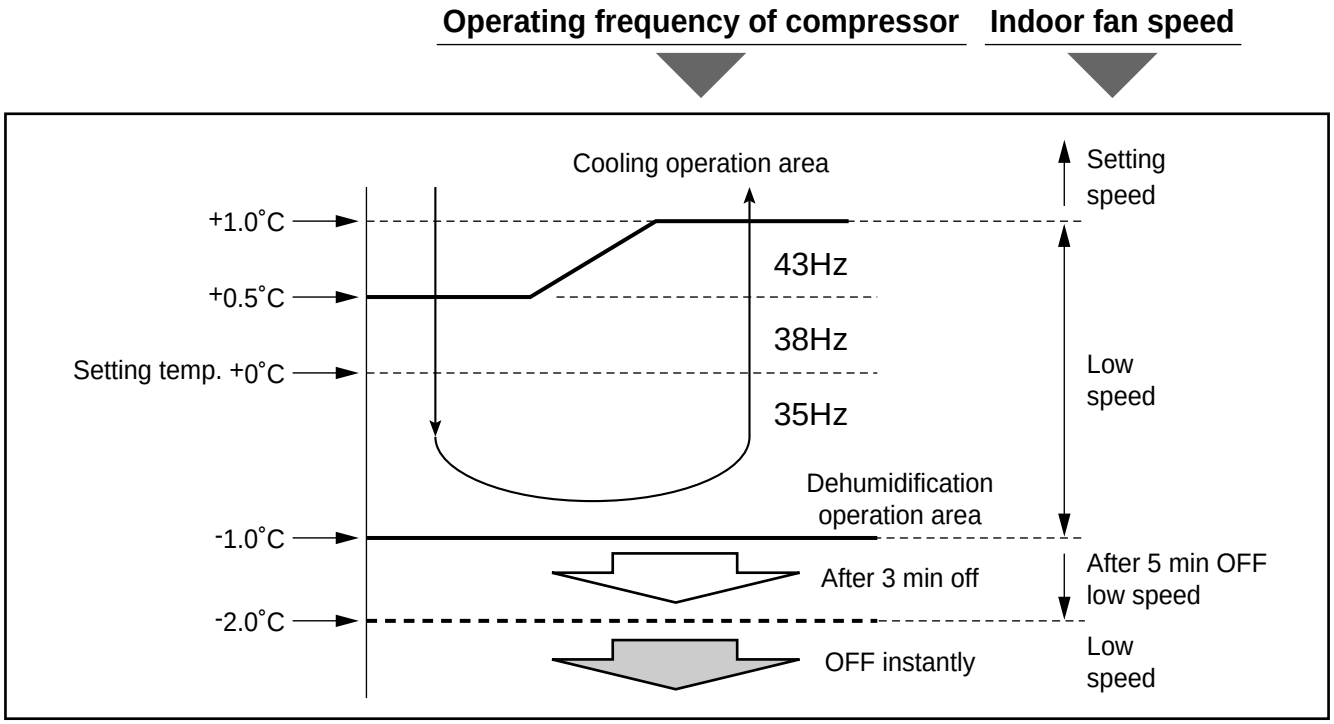
Model	Comp. Operating frequency					
	¤	¤Ł	¤Œ	¤ (Fc)	¤	¤
LS-J0760NL	35	38	47	56	66	73
LS-J0961NL/NT	41	53	64	73	80	86
LS-L1260NL/NT	35	38	47	58	66	73

5. Healthy Dehumidification mode operation

• When the dehumidification operation is set by the remote controller the intake air temperature is detected and the setting temp. is automatically set according to the intake air temperature.

Temp. differences	Comp. Operating frequency
32°C ≤ intake air temp.	25°C
26°C ≤ intake air temp. < 32°C	25°C
24°C ≤ intake air temp.< 26°C	intake air temp. -1°C
18°C < intake air temp. < 24°C	intake air temp. -0.5°C
intake air temp. ≤ 18°C	18°C

• Operating frequency of compressor and indoor fan speed.



6. Heating mode operation

- Operating frequency of compressor depend on the difference of the temperature (= compressor off temp. - intake air temp.)
- Compressor off temp. = setting temp.+3.0°C
  on temp. = setting temp.
- If compressor operates at some operation frequency, the operating frequency of compressor cannot be changed within 30 seconds.
- Condition of compressor turned off
  - When intake air temperature reaches +3°C above the setting temperature.
- Condition of indoor fan turned off
  - While in compressor on:indoor pipe temp. < 26°C
    off: indoor pipe temp. < 37°C
- While in defrost control, between the indoor and outdoor fans are turned off.
- Compressor 2minutes delay
  - After compressor off, the compressor can restart minimum 2 minutes later.

[The operating freq. step of comp]

Temp. differences	Comp. Operating frequency
over 3.0°C	§
2.5~3.0°C	¤1
2.0~2.49°C	¤
1.5~1.99°C	¤
1.0~1.49°C	¤°
0.5~0.99°C	¤Ø
0.0~0.49°C	¤

[The targeting operating freq. of comp. each model]

Model	Comp. Operating frequency						
	¤	¤Ø	¤°	¤	¤ (Fh)	¤1	§
LS-J0760NL	35	43	53	66	78	83	92
LS-J0961NL/NT	40	56	68	78	90	96	105
LS-L1260NL/NT	43	47	53	64	73	83	90

7. Fuzzy mode operation

- When any of operation mode is not selected like the moment of the power on or when the unit turned off, the operation mode is selected.
- When determining the operation mode, the compressor, outdoor fan are off and only the indoor fan is operated for 15seconds, then an operation mode is selected according to.

Basis of determining operating mode

Outdoor temp.	Operating Mode
over 24°C	Cooling
21~24°C	Healthy Dehumidification
18~21°C	intake air temp. ≥ 25°C …Dehumidification intake air temp. < 25°C … Heating
below 18°C	Heating

7.1 Fuzzy operation for cooling

- According to the setting temperature selected by Fuzzy rule, the operating frequency of compressor is determined like cooling mode operation.
- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temperature at that time.
- When the Fuzzy key(=setting temp. key) is input after the initial setting temperature is selected, the Fuzzy key value and intake air temperature at that time are compared to select the setting temperature automatically according to the fuzzy rule.
- While in Fuzzy operation, the air flow speed of the indoor fan is automatically operated by chaos logic.

	Intake air temp.	Setting temp.	Fan speed
at beginning	over 26°C	25°C	CHAOS airflow
	18~26°C	intake air temp. -05°C	
	below 18°C	18°C	
during opertion	18~30°C	Fuzzy rule	
	below 18°C	18°C Fuzzy rule	
	over 30°C	30°C Fuzzy rule	

7.2 Fuzzy operation for Heating

- According to the setting temperature selected by Fuzzy rule, the operating frequency of compressor is determined like heating mode operation.
- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temperature at that time.
- When the Fuzzy key(=setting temp. key) is input after the initial setting temperature is selected, the Fuzzy key value and intake air temperature at that time are compared to select the setting temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan is automatically operated by CHAOS logic.

	Outdoor temp.	**Setting temp.**	**Fan speed**
at beginning	over 26°C	intake air temp. +0.5°C	CHAOS airflow
	0~5°C	intake air temp. +1.0°C	
	-5~0°C	intake air temp. +1.5°C	
	below -5°C	intake air temp. +2.0°C	
during opertion	16~30°C	Fuzzy rule	
	below 16°C	18°C Fuzzy rule	
	over 30°C	30°C Fuzzy rule	

7.3 Fuzzy operation for dehumidification

- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temperature at that time.
- According to the setting temperature selected by Fuzzy rule, the operating frequency of compressor is determined like dehumidefication mode operation.

	Outdoor temp.	**Setting temp.**	**Fan speed**
at beginning	over 26°C	25°C	CHAOS airflow
	18~26°C	intake air temp. -0.5°C	
	below 18°C	18°C	
during operation	same as dehumidification mode		

8. Jet cool mode operation

- While in heating mode or Fuzzy operation, the Jet Cool key cannot be input. When it is input while in the other mode operation(cooling, dehumidification, ventilation), the Jet Cool mode is operated.
- In the Jet Cool mode, the indoor fan is operated super-high speed for 30 min. at cooling mode operation.
- In the Jet Cool mode, the room temperature is controlled to the setting temperature, 18°C.
- When the sleep timer mode input while the Jet Cool mode operation, the Jet Cool mode has the priority.
- When the Jet Cool key is input, the upper/lower vane is reset to those of the initial cooling mode and then operated in order that the air outflow could reach further.

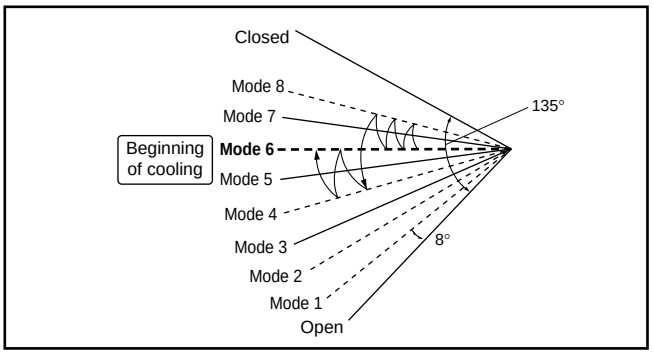
9. Swing mode

9.1 Chaos swing mode of not fuzzy mode operation

- By the Chaos swing key input, the upper/lower vane automatically operates with the Chaos swing or it is fixed to the desired direction.

Chaos swing of LS-J0760NL/LS-J0901NL/NT

< Cooling Mode >



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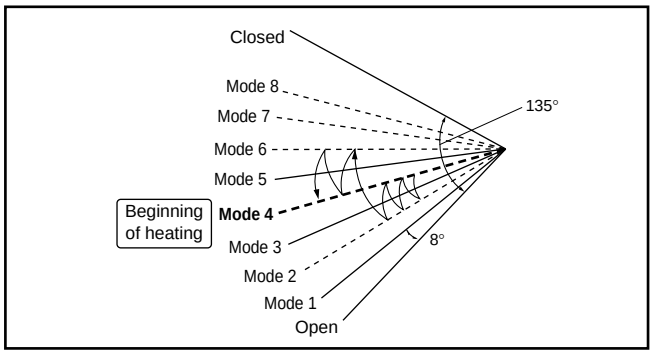

Chaos swing of SL-L1260NL/NT

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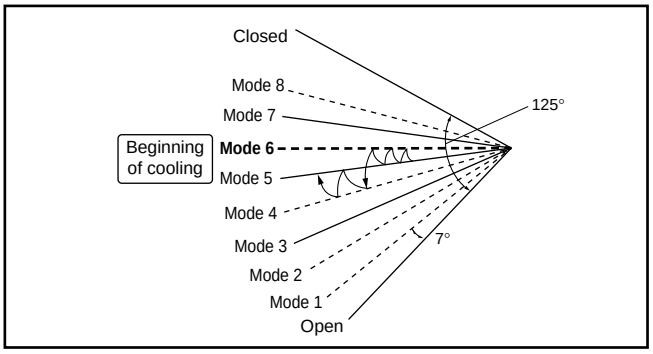

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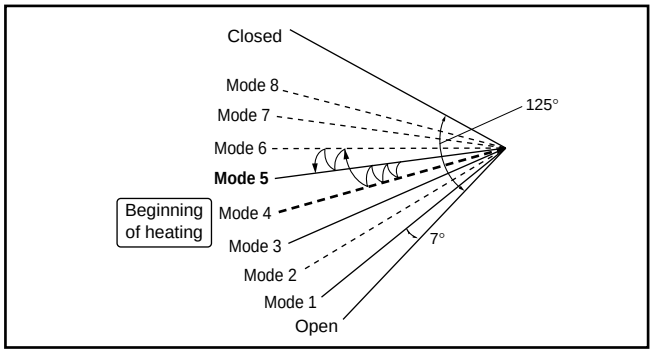
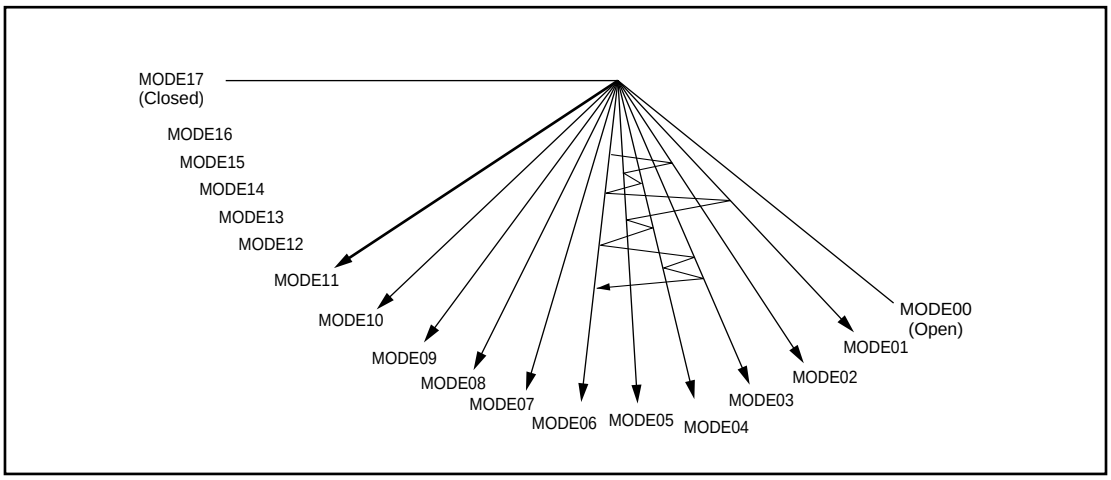


9.2 Auto swing of Fuzzy mode operation

• While in Fuzzy mode operation, Chaos swing is operated according to 1/f fluctuation.

1/f fluctuation

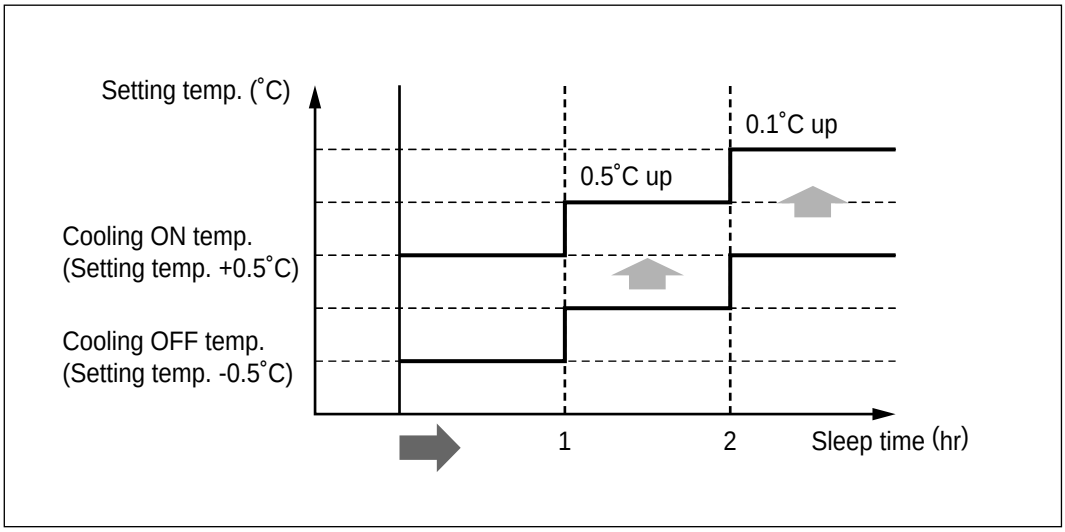


10. Sleep timer operation

- When the sleep time is reached after [1,2,3,4,5,6,7hr] is input by the remote control during the operation, the operation of the appliance stops.
- When the appliance is on pause, the sleep timer mode cannot be input.

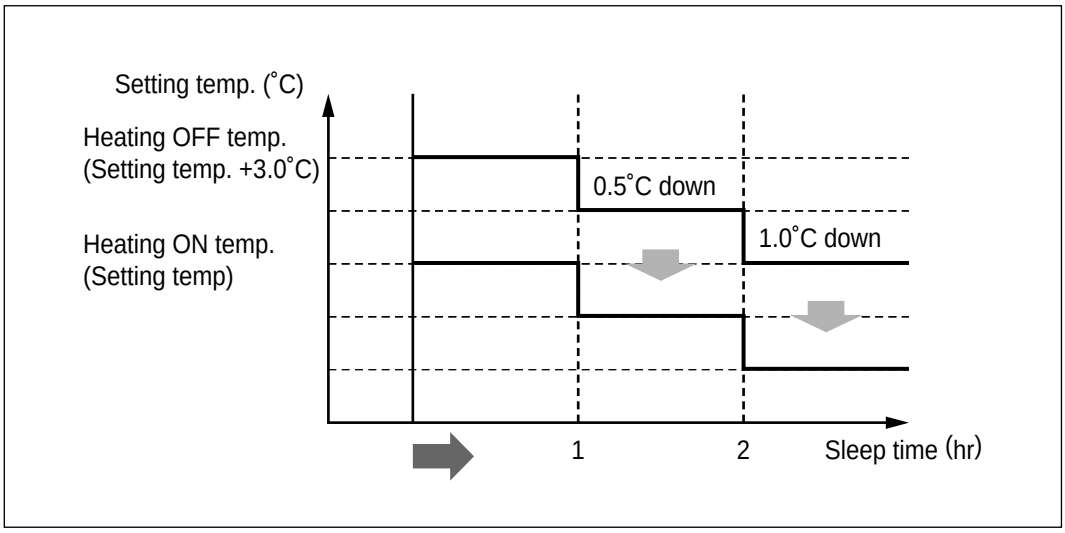
10.1 Sleep timer operation for cooling cycle

- While in cooling mode operation, 60 min. later since the start of the sleep timer, the setting temperature increase by 0.5°C. After another 60min. elapse, it increases by 1°C again.



10.2 Sleep timer operation for heating cycle

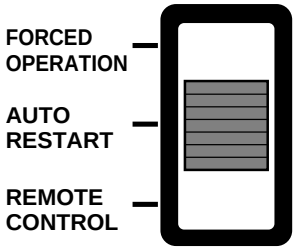
- While in heating mode operation, 60 min. later since the start of the sleep timer, the setting temperature decrease by 0.5°C. After another 60min. elapse, it decreases by 1°C again.



11. Auto restarting operation

- When the power is restarted after a sudden power failure while in appliance operation, the mode before the power failure is kept on the memory and the appliance automatically operates in the mode on the memory.
- The slide switch on the indoor unit of the appliance should be on the AUTO RESTART position in order that the Auto restarting operation is available.
- Operation mode that is kept on the memory
  — State of operation ON/OFF
  — Operation mode/setting temp./selected airflow speed
  — Sleep timer mode/remaining time of sleep timer
- If no input by the remote control or no switching of the slide switch within 7 hours after the appliance operates by the Auto restarting operation, the appliance is forced to stop at the moment of 7-hr elapse.

Slide Switch of indoor unit



12. Forced operation

- To operate the appliance by force in case that the remote control is lost, the forced operation selection switch is on the main unit of the appliance to operate the appliance in the standard conditions.
- The operation condition is set according to the outdoor temp. and intake air temperature as follows.

Outdoor temp.	Operating Mode	Setting temp.	Setting speed of indoor fan
over 24°C	Cooling	22°C	High speed
21~24°C	Healthy Dehumidification	23°C	
18~21°C	Intake air temp. ≥ 25°C ➔ Dehumidification	23°C	
	Intake air temp. < 25°C ➔ Heating	24°C	
below 18°C	Heating	24°C	

13. Power relay control

- Power relay turns on 1 second later after the power is input to the outdoor unit.
- Control sequence : power on ➔ PTC operating ➔ power relay on

14. Protection from total current control

■ CT1 control

- If the operating current reaches I1, the operating frequency of the compressor decrease.
- After decreasing the operating frequency by 1step, if operating current is below I1 for 24 seconds continuously, the operating frequency of compressor increase by 1step.

■ CT2 control

- If the operating current of the appliance reaches I2, the compressor stop instantly and 2 minutes later the compressor restart again.
- If CT2 occurs twice within 1hour, the appliance turn off and display ERROR CODE 7.

Control table

✵ I1:Current of operating frequency down
I2: Current of compressor cut off

Condition \ Model		LS-J0760NL		LS-J0961NL/NT		LS-L1260NL/NT	
Operating mode		Cooling	Heating	Cooling	Heating	Cooling	Heating
below 38°C (outdoor temp.)	I1	7.5A	8.0A	8.5A	10A	10.5A	12A
	I2	11.5A		13.5A		13.5A	
over 38°C (outdoor temp.)	I1	7.5A	8.0A	8.5A	10A	10A	11.5A
	I2	11.5A		13.5A		13.5A	

cf. I1 is set the lowest level between intial value and in case dectection of dc paeak current.

15. Protection from DC Peak Current

■ DC Peak Current Error by a fault signal of IPM

- If the operating current of IPM reaches 35A ±3A, the compressor stop instantly.
- If DC PEAK occurs 3 times within 1 hour, the appliance turns off and display ERROR CODE 6.

■ DC Peak Current Error by the compressor lock

- If the DC LINK voltage below DC 350V occurs 5 times within 1 hour while the compressor is operating, the appliance turns off and display ERROR CODE 6

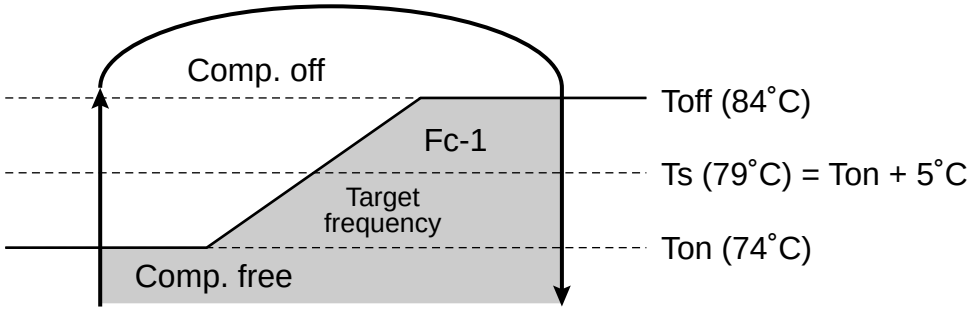
■ DC Peak Current Error by the Outdoor Fan Lock

- If it's 5 times within 1 hour in case of the temperature of outdoor pipe TH is over 65°C while the compressor is operating, the appliance turns off and display ERROR CODE 6

16. Portection from overheating of power module

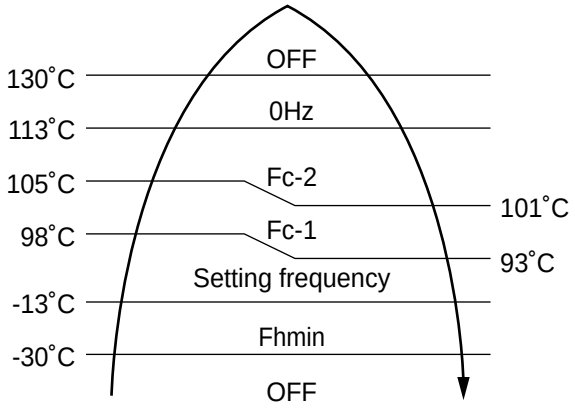
- If the temperature of the heat sink TH. reaches over Toff, the Compressor stop instantly.
- It will be limited the compressor operating frequency according to the heat sink TH.(refer to below FIG.)
- It will be blink 4 times, when the thermistor is open or short, also the temperature is over Toff.

[The control graph from heat–sink TH]



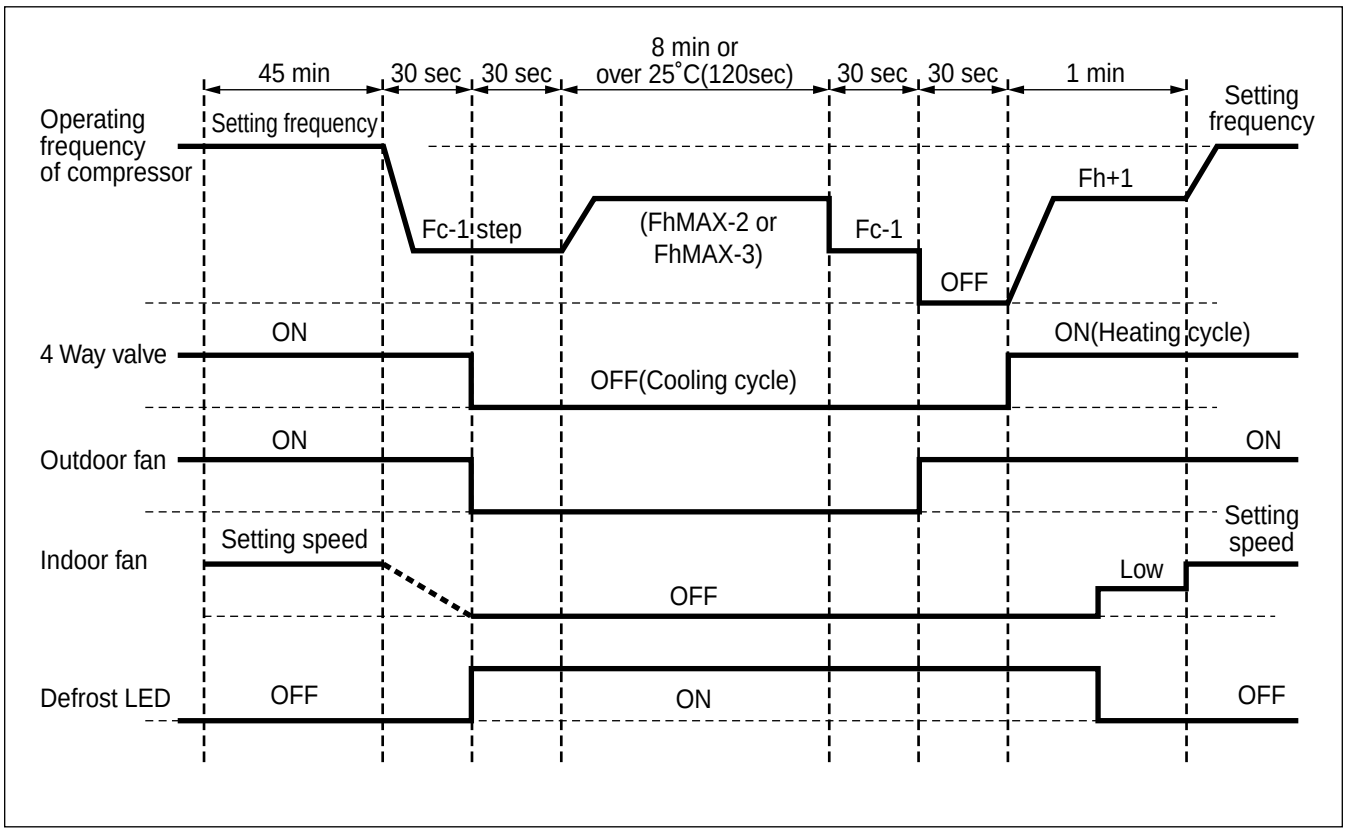
17. Portection from overheating of compressor

- If the temperature of the discharge pipe of compressor reaches over 130°C or below -30°C the compressor stop instantly.
- It will be limited the compressor operating frequency according to the compressor dome TH.(Refer to below Fig.)



18 . Defrosting control

- While in heating mode operation in order to protect the evaporator pipe of the outdoor unit from freezing, reversed to cooling cycle to defrost the evaporator pipe of the outdoor unit.
- Defrosting control is available 45 minutes later since heating cycle started and the pipe temperature of outdoor unit reaches below -6°C.



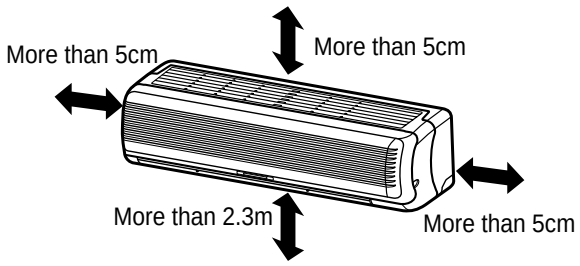
Installation

1. Installation of indoor, Outdoor unit

1) Select the best location

1. Indoor unit

- § Do not have any heat or steam near the unit.
- § Select a place where there are no obstacles in front of the unit.
- § Make sure that condensation drainage can be conveniently routed away.
- § Do not install near a doorway.
- § Ensure that the space around the left and right of the unit is more than 5cm. The unit should be installed as high on the wall as possible, allowing a minimum of 5cm from ceiling.
- § Use a stud finder to locate studs to prevent unnecessary damage to the wall.

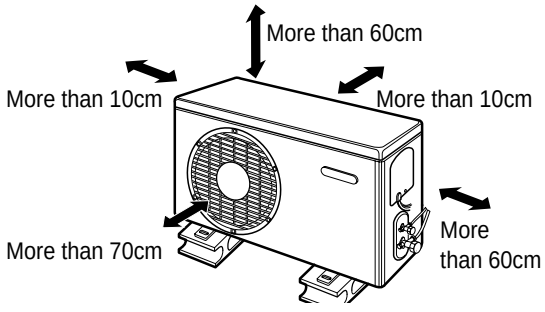


⚠ CAUTION

Install the indoor unit on the wall where the height from the floors more than 2.3 meters.

2. Outdoor unit

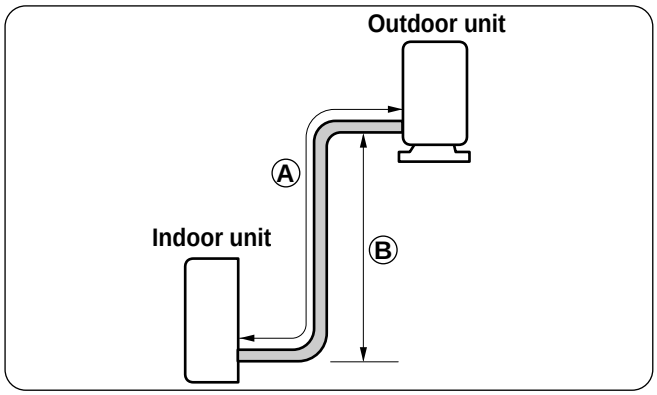
- § If an awning is built over the unit to prevent direct sunlight or rain exposure, make sure that heat radiation from the condenser is not restricted.
- § Ensure that the space around the back and sides is more than 10cm. The front of the unit should have more than 70cm of space.
- § Do not place animals and plants in the path of the warm air.
- § Take the air conditioner weight into account and select a place where noise and vibration are minimum.
- § Select a place so that the warm air and noise from the air conditioner do not disturb neighbors.

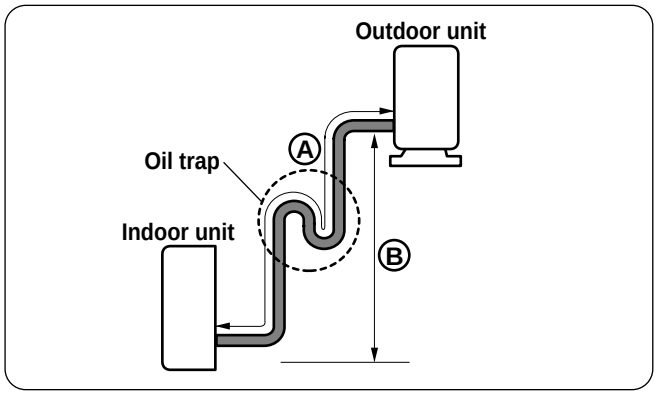


* Both gas and liquid interconnecting pipes must be insulated as a pair, but it is not necessary to individually insulate them.

2) Piping length and elevation

Capacity (Btu/h)	Pipe Size		Standard Length (m)	Max. Elevation Ⓑ (m)	Max. length Ⓐ (m)	Additional Refrigerant (g/m)
	GAS	LIQUID				
7K	3/8"	1/4"	5	7	15	20
9K, 12K	1/2"	1/4"	5	7	15	20





In case more than 5m

CAUTION

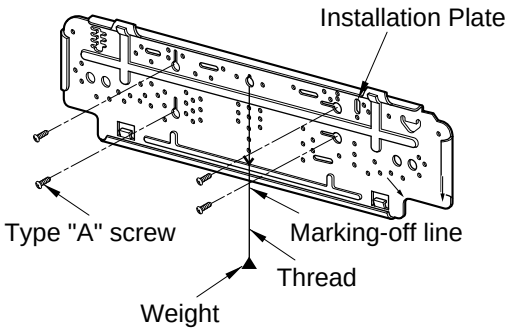
- Capacity is based on standard length and maximum allowance length is on the basis of reliability.
- Oil trap should be installed every 5~7 meters.

3) How to fix installation plate

The wall you select should be strong and solid enough to prevent vibration

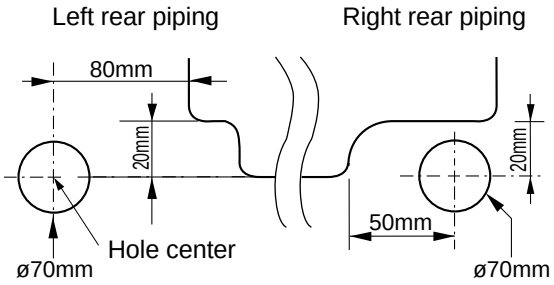
1. Mount the installation plate on the wall with four type A screws. If mounting the unit on a concrete wall, use anchor bolts.

§ Mount the installation plate horizontally by aligning the centerline using a level.

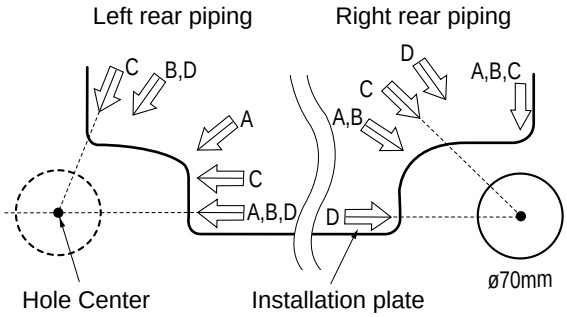


2. Measure the wall and mark the centerline. It is also important to use caution concerning the location of the installation plate-routing of the wiring to power outlets is through the walls typically. Drilling the hole through the wall for piping connections must be done safely.

9k Btu

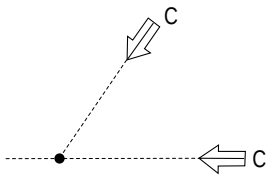
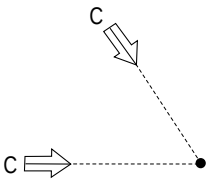


12k Btu



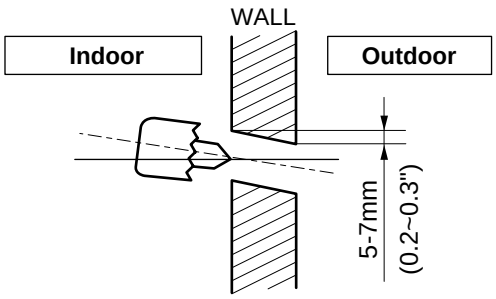
§ For right rear piping and left rear piping, draw a line in the direction of the arrow marked "C". The meeting point of the two lines is the center of the hole.

❒ The position of the center of the hole.

Left holecore position	Right holecore position
	

4) Drill a hole in the wall

• Drill the piping hole with a ø70mm hole core drill. Drill the piping hole at either the right or the left with the hole slightly slanted to the outdoor side.



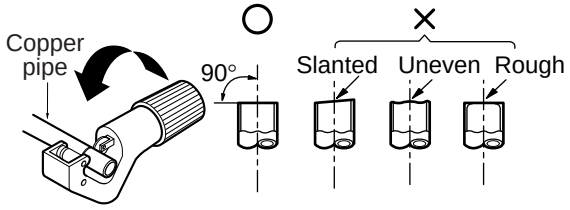
2. Flaring work and connection of piping

1) Flaring work

Main cause for gas leakage is due to defect in flaring work. Carry out correct flaring work in the following procedure.

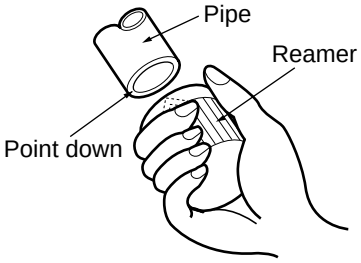
1. Cut the pipes and the cable.

§ Use the piping kit accessory or the pipes purchased locally.
§ Measure the distance between the indoor and the outdoor unit.
§ Cut the pipes a little longer than measured distance.
§ Cut the cable 1.5m longer than the pipe length.



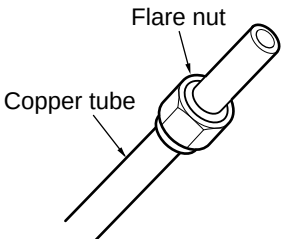
2. Burrs removal

§ Completely remove all burrs from the cut cross section of pipe/tube.
§ Put the end of the copper tube/pipe in a downward direction as you remove burrs in order to avoid dropping burrs into the tubing.



3. Putting nut on

§ Remove flare nuts attached to indoor and outdoor unit, then put them on pipe/tube having completed burr removal.
(not possible to put them on after flaring work)

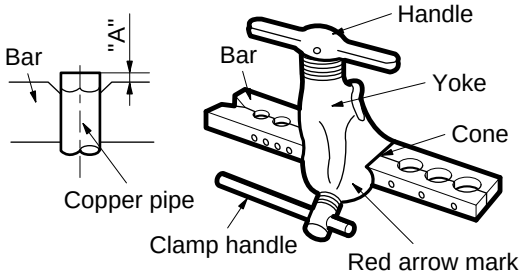


4. Flaring work

§ Carry out flaring work using flaring tool as shown below.

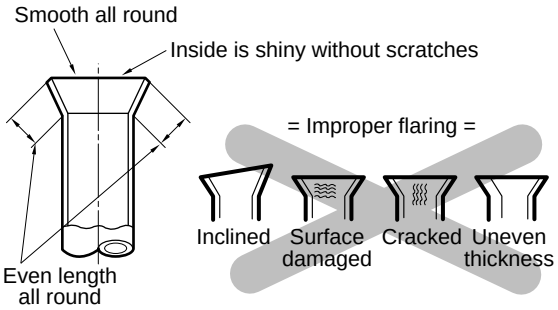
Outside diameter		A
mm	inch	mm
ø6.35	1/4	0~0.5
ø9.52	3/8	0~0.5
ø12.7	1/2	0~0.5

Firmly hold copper pipe in a die in the dimension shown in the table above.



5. Check

§ Compare the flared work with figure below.
§ If flare is noted to be defective, cut off the flared section and do flaring work again.

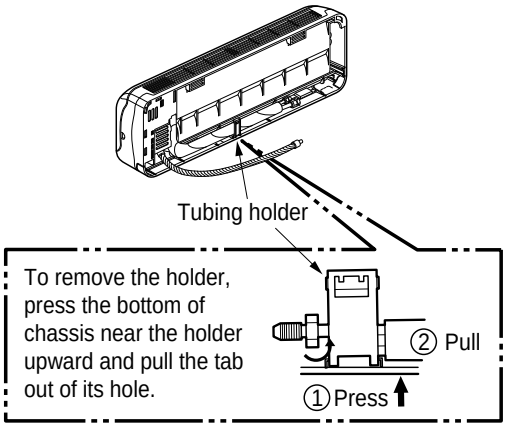


2) Connection of piping-Indoor

§ Preparing the indoor unit's piping and drain hose for installation through the wall.

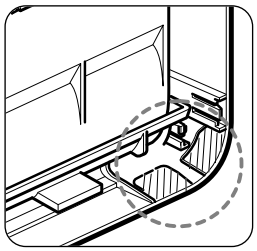
§ Remove the plastic tubing retainer(see illustration below) and pull the tubing and drain hose away from chassis.

§ Replace the plastic tubing holder in the original position.


Tubing holder
To remove the holder, press the bottom of chassis near the holder upward and pull the tab out of its hole.
② Pull
① Press

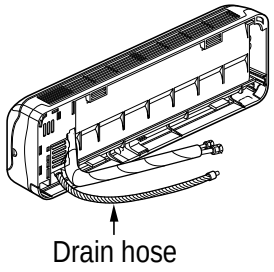
CAUTION

When install, make sure that the remaining parts must be removed clearly so as not to damage the piping and drain hose, especially power cord and connecting cable.



For left rear piping

1. Route the indoor tubing and the drain hose in the direction of rear left.

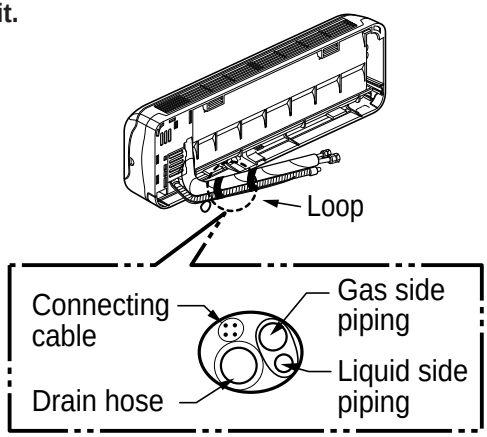


2. Insert the connecting cable into the indoor unit from the outdoor unit through the piping hole.

§ Do not connect the cable to the indoor unit.

§ Make a small loop with the cable for easy connection later.

3. Tape the tubing, drain hose and the connecting cable. Be sure that the drain hose is located at the lowest side of the bundle. Locating at the upper side can cause drain pan to overflow inside the unit.

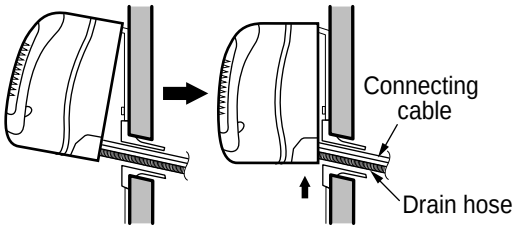


NOTE: If the drain hose is routed inside the room, insulate the hose with an insulation material***** so that dripping from "sweating"(condensation) will not damage furniture or floors.

*****Foamed polyethylene or equivalent is recommended.

4. Indoor unit installation

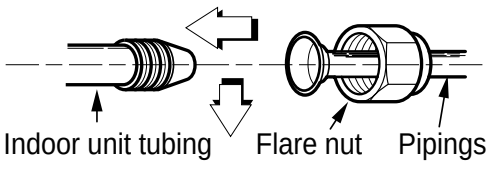
§ Hook the indoor unit onto the upper portion of the installation plate.(Engage the two hooks of the rear top of the indoor unit with the upper edge of the installation plate.) Ensure that the hooks are properly seated on the installation plate by moving it left and right.



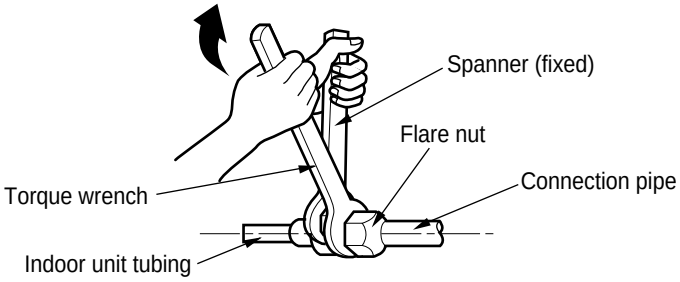
Press the lower left and right sides of the unit against the installation plate until the hooks engage into their slots(clicking sound).

5. Connecting the pipings to the indoor unit and drain hose to drain pipe.

§ Align the center of the pipings and sufficiently tighten the flare nut by hand.

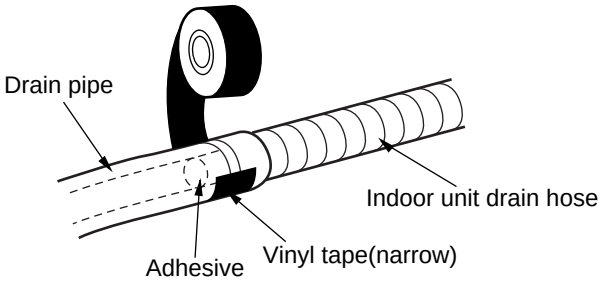


§ Tighten the flare nut with a wrench.



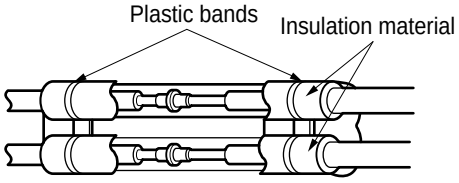
Capacity (Btu/h)	Pipe Size[Torque]	
	GAS	LIQUID
7k	3/8"[4.2kg·m]	1/4"[1.8kg·m]
9k, 12k	1/2"[5.5kg·m]	1/4"[1.8kg·m]

§ When extending the drain hose at the indoor unit, install the drain pipe.

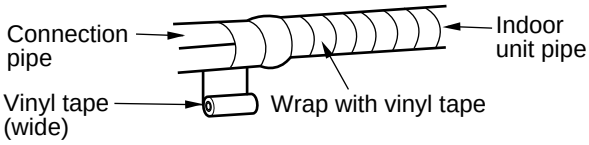


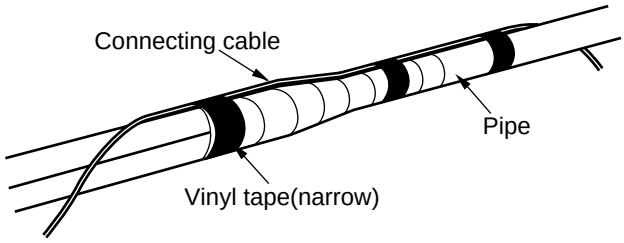
6. Wrap the insulation material around the connecting portion.

§ Overlap the connection pipe insulation material and the indoor unit pipe insulation material. Bind them together with vinyl tape so that there is no gap.

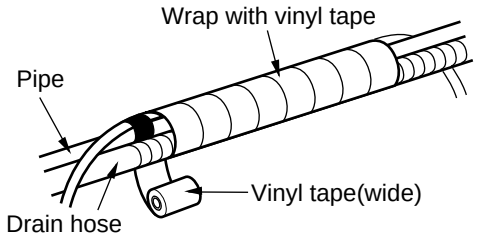


§ Wrap the area which accommodates the rear piping housing section with vinyl tape.



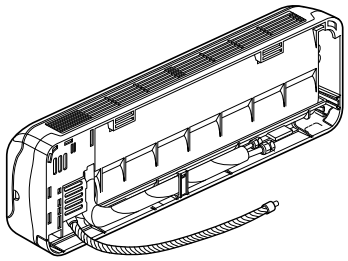


§ Bundle the piping and drain hose together by wrapping them with vinyl tape over the range within which they fit into the rear piping housing section.

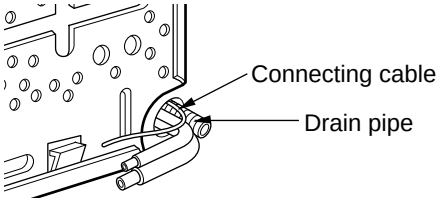


For right rear piping

1. Route the indoor tubing and the drain hose to the required piping hole position.



2. Insert the piping, drain hose and the connecting cable into the piping hole.



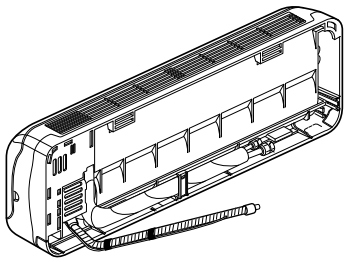
3. Insert the connecting cable into the indoor unit.

§ Don't connect the cable to the indoor unit.

§ Make a small loop with the cable for easy connection later.

4. Tape the drain hose and the connecting cable.

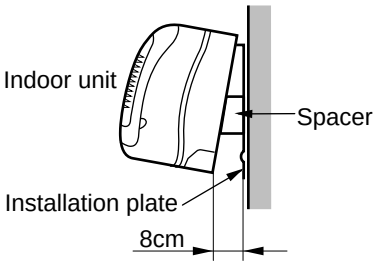
§ Connecting cable



5. Indoor unit installation

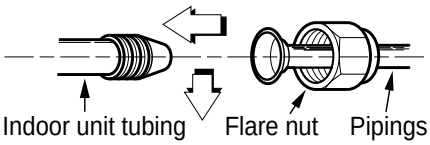
§ Hang the indoor unit from the hooks at the top of the installation plate.

§ Insert the spacer etc. between the indoor unit and the installation plate and separate the bottom of the indoor unit from the wall.

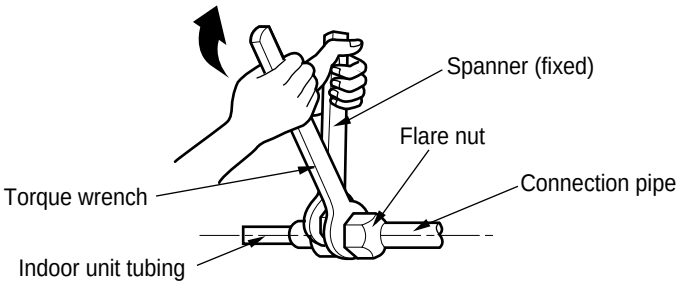


6. Connecting the pipings to the indoor unit and the drain hose to drain pipe.

§ Align the center of the pipings and sufficiently tighten the flare nut by hand.

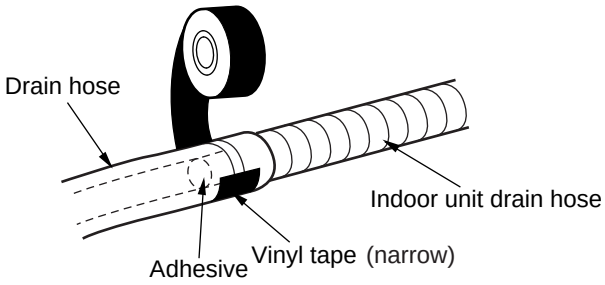


§ Tighten the flare nut with a wrench.



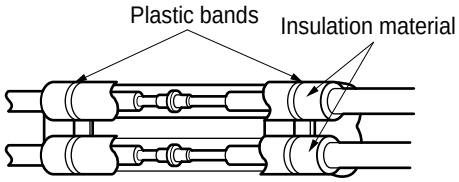
Capacity (Btu/h)	Pipe Size[Torque]	
	GAS	LIQUID
7k	3/8"[4.2kg·m]	1/4"[1.8kg·m]
9k, 12k	1/2"[5.5kg·m]	1/4"[1.8kg·m]

§ When extending the drain hose at the indoor unit, install the drain pipe.

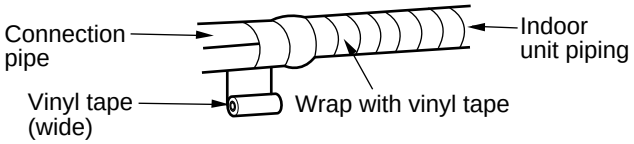


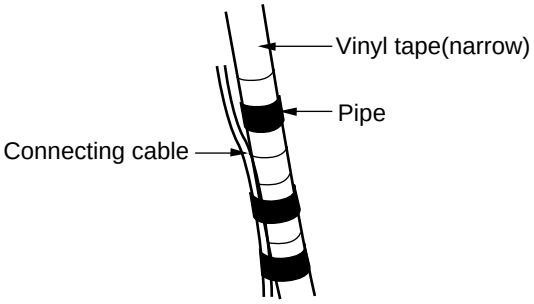
7. Wrap the insulation material around the connecting portion.

§ Overlap the connection pipe heat insulation and the indoor unit pipe heat insulation material. Bind them together with vinyl tape so that there is no gap.

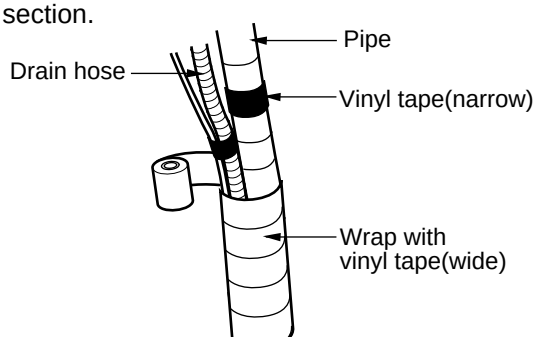


§ Wrap the area which accommodates the rear piping housing section with vinyl tape.

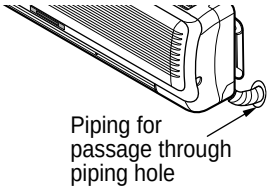




§ Bundle the piping and drain hose together by wrapping them with cloth tape over the range within which they fit into the rear piping housing section.

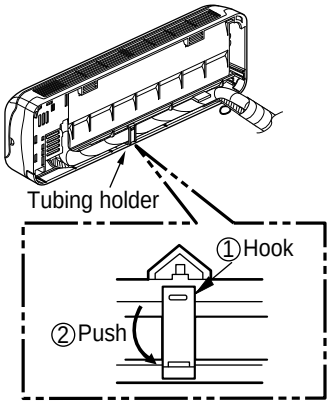


8. Reroute the pipings and the drain hose across the back of the chassis.



9. Set the pipings and the drain hose to the back of the chassis with the tubing holder.

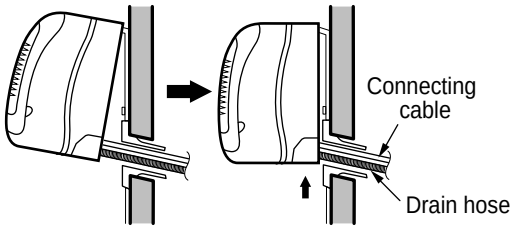
§ Hook the edge of tubing holder to tap on chassis and push the bottom of tubing holder to be engaged at the bottom of chassis.



10. Indoor unit installation

§ Remove the spacer.

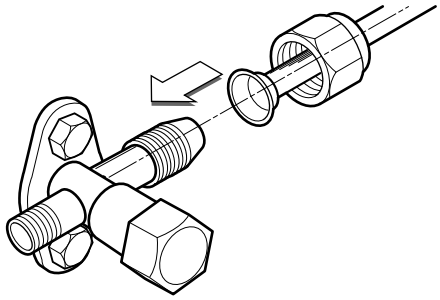
§ Ensure that the hooks are properly seated on the installation plate by moving it left and right.



Press the lower left and right sides of the unit against the installation plate until the hooks engage into their slots(clicking sound).

3) Connection of the pipes-Outdoor

1. Align the center of the pipings and sufficiently tighten the flare nut by hand.

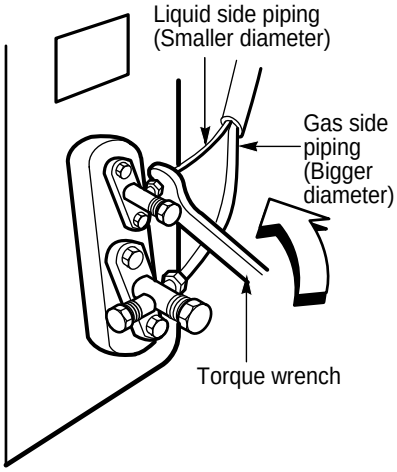


2. Finally, tighten the flare nut with torque wrench until the wrench clicks.

§ When tightening the flare nut with torque wrench, ensure the direction for tightening follows the arrow on the wrench.

Capacity (Btu/h)	Pipe Size[Torque]	
	GAS	LIQUID
7k	3/8"[4.2kg·m]	1/4"[1.8kg·m]
9k, 12k	1/2"[5.5kg·m]	1/4"[1.8kg·m]

Outdoor unit

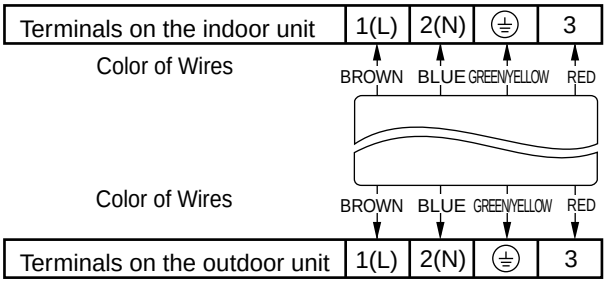


3. Connecting the Cable Between Indoor Unit and Outdoor Unit

1) Connect the cable to the Indoor unit.

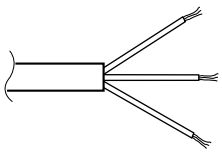
§ Connect the cable to the indoor unit by connecting the wires to the terminals on the control board individually according to the outdoor unit connection.
(Ensure that the color of the wires of the outdoor unit and the terminal No. are the same as those of the indoor unit.)

• Inverter model



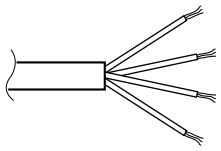
CAUTION

The power cord connected to the indoor unit should be complied with the following specifications
(Type H05VV-F approved by HAR or SAA).



NORMAL CROSS-SECTIONAL AREA
7K,9K:1.0mm² ↑
12K:1.5mm² ↑

The connecting cable connected to the indoor and outdoor unit should be complied with the following specifications
(Type H07RN-F approved by HAR or SAA).

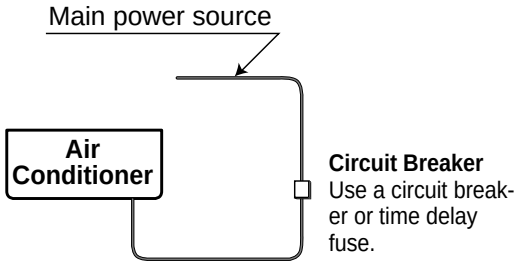


NORMAL CROSS-SECTIONAL AREA
7K,9K:1.0mm² ↑
12K:1.5mm² ↑

The length of the power supply cord should be over 1.8m measured from the power supply cord entry of the cabinet to the middle of the live pin of the plug.

CAUTION

If a power plug is not to be used, provide a circuit breaker between power source and the unit as shown below.



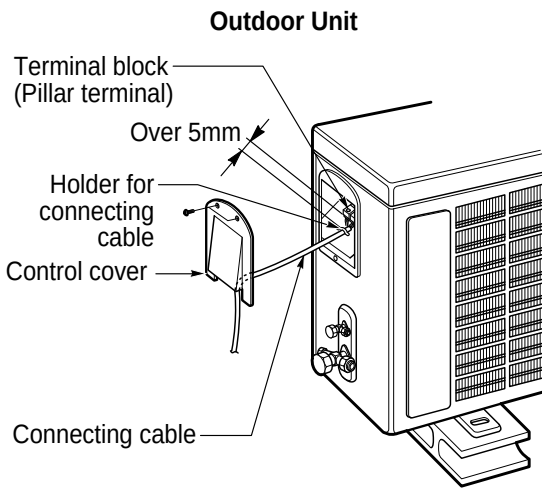
2) Connect the cable to the outdoor unit

1. Remove the control cover from the unit by loosening the screw.
   Connect the wires to the terminals on the control board individually.

2. Secure the cable onto the control board with the cord clamp.

3. Refix the control cover to the original position with the screw.

4. Use a recognized circuit breaker 16A between the power source and the unit. A disconnecting device to adequately disconnect all supply lines must be fitted.



CAUTION

After the confirmation of the above conditions, prepare the wiring as follows:

1) Never fail to have an individual power circuit specifically for the air conditioner. As for the method of wiring, be guided by the circuit diagram posted on the inside of control cover.

2) The screw which fasten the wiring in the casing of electrical fittings are liable to come loose from vibrations to which the unit is subjected during the course of transportation. Check them and make sure that they are all tightly fastened.
(If they are loose, it could cause burn-out of the wires.)

3) Specification of power source.

4) Confirm that electrical capacity is sufficient.

5) See to that the starting voltage is maintained at more than 90 percent of the rated voltage marked on the name plate.

6) Confirm that the cable thickness is as specified in the power source specification.
(Particularly note the relation between cable length and thickness.)

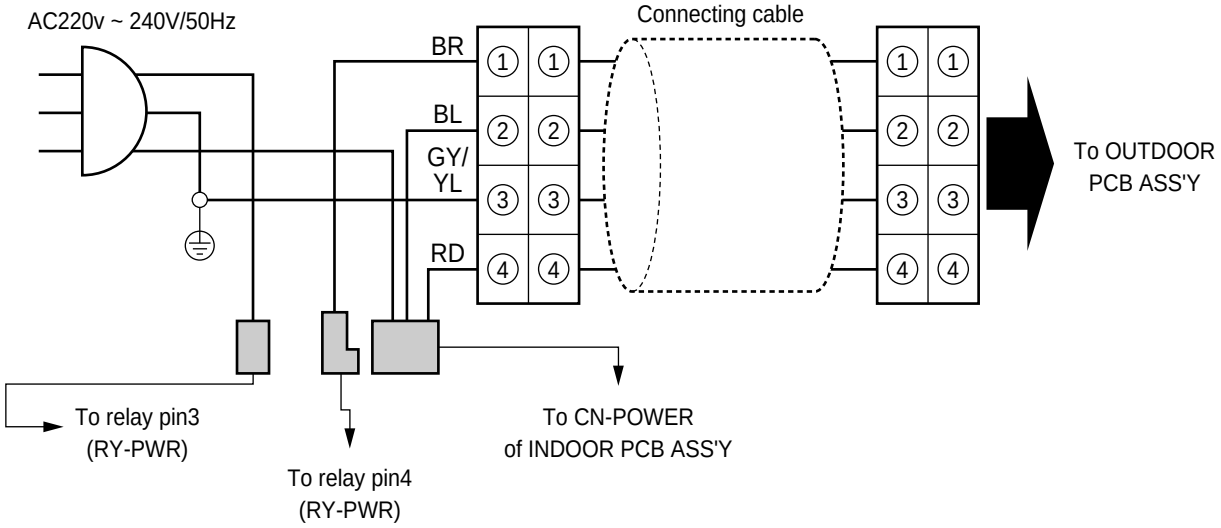
7) Always install an earth leakage circuit breaker in a wet or moist area.

8) The following would be caused by voltage drop.

- Vibration of a magnetic switch, which will damage the contact point, fuse breaking, disturbance of the normal function of the overload.

9) The means for disconnection from a power supply shall be incorporated in the fixed wiring and have an air gap contact separation of at least 3mm in each active(phase) conductors.

3) How to connect between Indoor unit and Outdoor unit



Note

1) The earth line must connect to protect noise of EMI, EMS .
2) If it is not connect the earth line, It may occur safety problems.
3) If it crossed No1, No2 of fillet terminal, it must occur communication error (error code 5) but communication circuit is not malfunction.
4) The related earth line must be connected for EMC.

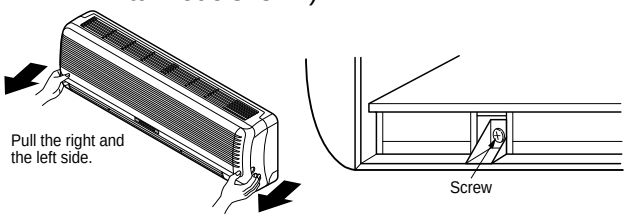
4. Checking the Drainage and Forming the Pipings

1) Checking the drainage

1. To remove the front panel from the indoor unit, remove the front panel from the indoor unit cabinet.

§ Set the air direction louvers up-and-down to the position(horizontally) by hand.

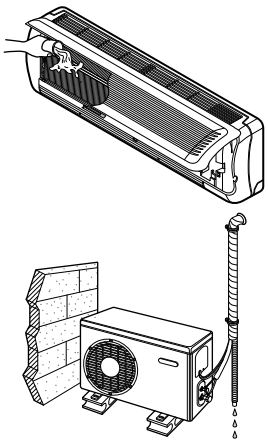
§ Remove the securing screws that retain the front panel. Pull the lower left and right sides of the grille toward you and lift it off.
(9K Btu models: 2EA,
12K Btu models: 3EA)



2. To check the drainage.

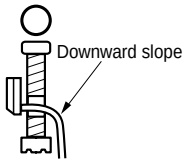
§ Pour a glass of water on the evaporator.

§ Ensure the water flows through the drain hose of the indoor unit without any leakage and goes out the drain exit.

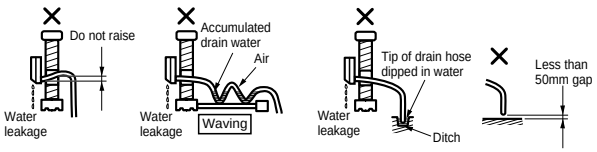


3. Drain piping

§ The drain hose should point downward for easy drain flow.



§ Do not make drain piping.



2) Form the piping

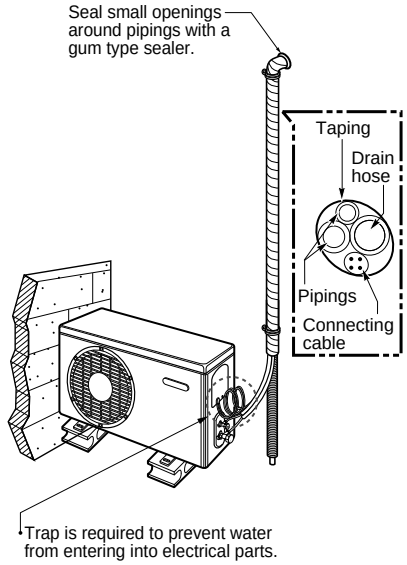
1. Form the piping by wrapping the connecting portion of the indoor unit with insulation material and secure it with two kinds of vinyl tapes.

§ If you want to connect an additional drain hose, the end of the drain outlet should be routed above the ground. Secure the drain hose appropriately.

2. In cases where the outdoor unit is installed below the indoor unit perform the following.

§ Tape the piping, drain hose and connecting cable from down to up.

§ Secure the tapped piping along the exterior wall using saddle or equivalent.

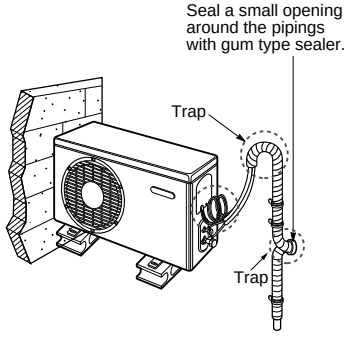

Seal small openings around pipings with a gum type sealer.
Taping
Drain hose
Pipings
Connecting cable
Trap is required to prevent water from entering into electrical parts.

3. In cases where the Outdoor unit is installed above the Indoor unit perform the following.

§ Tape the piping and connecting cable from down to up.

§ Secure the taped piping along the exterior wall. Form a trap to prevent water entering the room.

§ Fix the piping onto the wall by saddle or equivalent.



5. Air Purging

1) Air purging

Air and moisture remaining in the refrigerant system have undesirable effects as indicated below.

§ Pressure in the system rises.
§ Operating current rises.
§ Cooling(or heating) efficiency drops.
§ Moisture in the refrigerant circuit may freeze and block capillary tubing.
§ Water may lead to corrosion of parts in the refrigeration system.

Therefore, the indoor unit and tubing between the indoor and outdoor unit must be leak tested and evacuated to remove any noncondensables and moisture from the system.

2) Air purging with vacuum pump

1. Preparation

§ Check that each tube(both liquid and gas side tubes) between the indoor and outdoor units have been properly connected and all wiring for the test run has been completed. Remove the service valve caps from both the gas and the liquid side on the outdoor unit. Note that both the liquid and the gas side service valves on the outdoor unit are kept closed at this stage.

2. Leak test

§ Connect the manifold valve(with pressure gauges) and dry nitrogen gas cylinder to this service port with charge hoses.

CAUTION

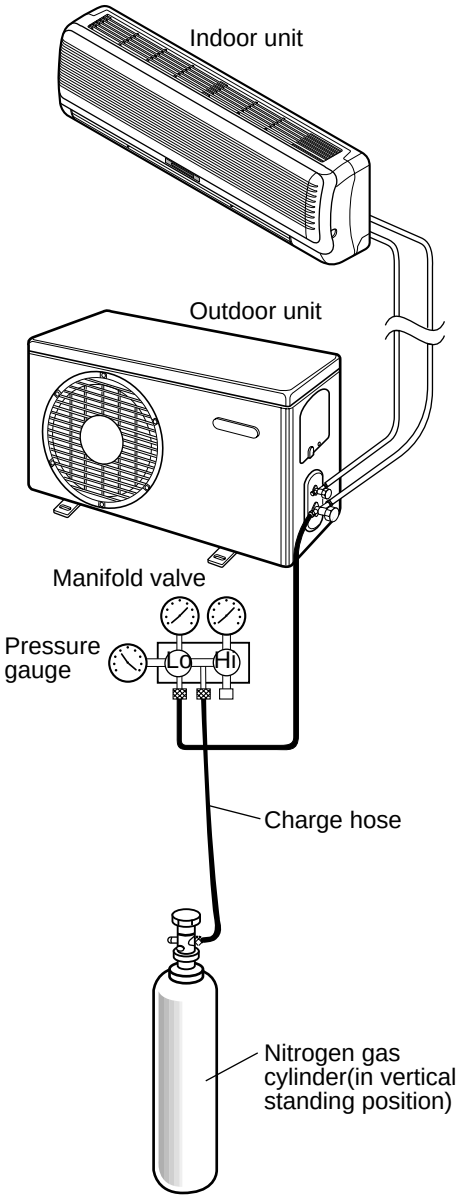
Be sure to use a manifold valve for air purging.
If it is not available, use a stop valve for this purpose.
The "Hi" knob of the manifold valve must always be kept close.

§ Pressurize the system to no more than 150 P.S.I.G. with dry nitrogen gas and close the cylinder valve when the gauge reading reached 150 P.S.I.G. Next, test for leaks with liquid soap.

CAUTION

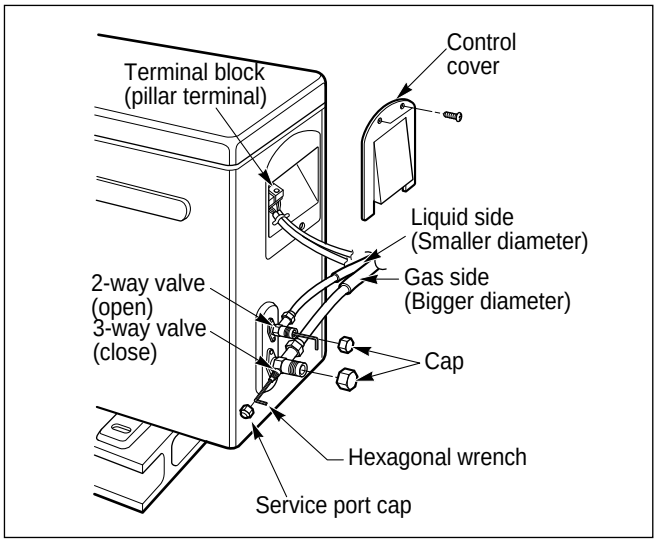
To avoid nitrogen entering the refrigerant system in a liquid state, the top of the cylinder must be higher than its bottom when you pressurize the system. Usually, the cylinder is used in a vertical standing position.

§ Do a leak test of all joints of the tubing(both indoor and outdoor) and both gas and liquid side service valves.
Bubbles indicate a leak. Be sure to wipe off the soap with a clean cloth.
§ After the system is found to be free of leaks, relieve the nitrogen pressure by loosening the charge hose connector at the nitrogen cylinder. When the system pressure is reduced to normal, disconnect the hose from the cylinder.



Soap water method

(1) Remove the caps from the 2-way and 3-way valves.
(2) Remove the service-port cap from the 3-way valve.
(3) To open the 2-way valve turn the valve stem counter-clockwise approximately 90°, wait for about 2~3 sec, and close it.
(4) Apply a soap water or a liquid neutral detergent on the indoor unit connection or outdoor unit connections by a soft brush to check for leakage of the connecting points of the piping.
(5) If bubbles come out, the pipes have leakage.



3. Evacuation

§ Connect the charge hose end described in the preceding steps to the vacuum pump to evacuate the tubing and indoor unit.
Confirm the "Lo" knob of the manifold valve is open. Then, run the vacuum pump.
The operation time for evacuation varies with tubing length and capacity of the pump.
The following table shows the time required for evacuation.

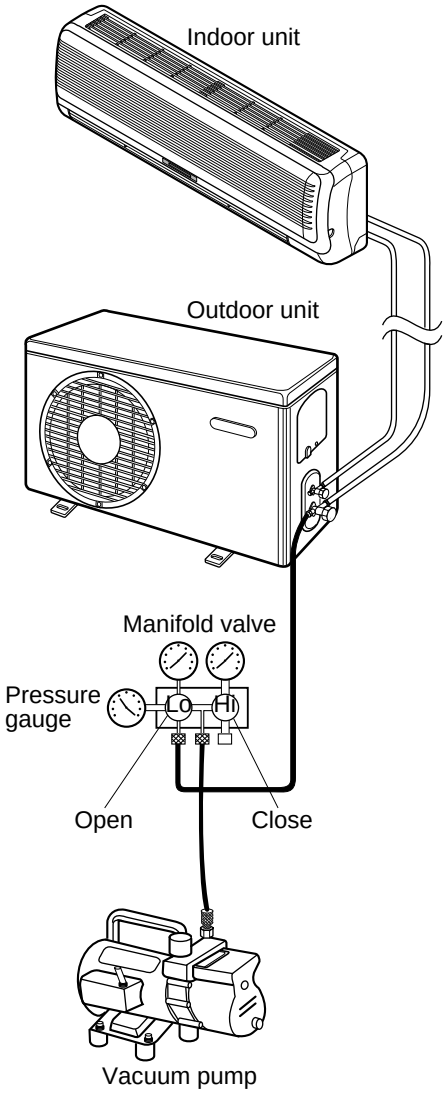
Required time for evacuation when 30 gal/h vacuum pump is used	
If tubing length is less than 10m (33 ft)	If tubing length is longer than 10m (33 ft)
10 min. or more	15 min. or more

§ When the desired vacuum is reached, close the "Lo" knob of the manifold valve and stop the vacuum pump.

4. Finishing the job

§ With a service valve wrench, turn the valve stem of liquid side valve counter-clockwise to fully open the valve.
§ Turn the valve stem of gas side valve counter-clockwise to fully open the valve.
§ Loosen the charge hose connected to the gas side service port slightly to release the pressure, then remove the hose.
§ Replace the flare nut and its bonnet on the gas side service port and fasten the flare nut securely with an adjustable wrench. This process is very important to prevent leakage from the system.
§ Replace the valve caps at both gas and liquid side service valves and fasten them tight.

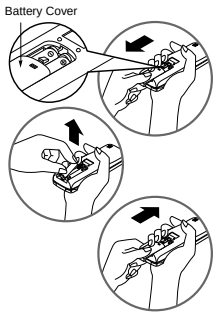
This completes air purging with a vacuum pump.
The air conditioner is now ready to test run.



6. Test Running

1. Check that all tubing and wiring have been properly connected.
2. Check that the gas and liquid side service valves are fully open.

1. Prepare remote control



1 Remove the battery cover by pulling it according to the arrow direction.

2 Insert new batteries making sure that the (+) and (–) of battery are installed correctly.

3 Reattach the cover by pushing it back into position.

NOTE:

• Use 2 AAA(1.5volt) batteries. Do not use rechargeable batteries.

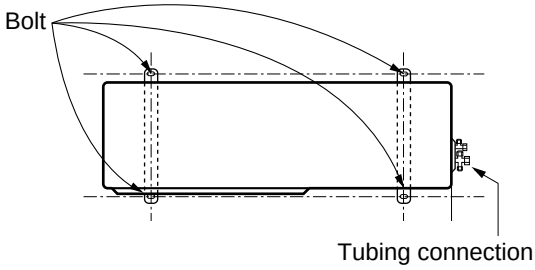
• Remove the batteries from the remote control if the system is not going to be used for a long time.

2. Settlement of outdoor unit

§ Anchor the outdoor unit with a bolt and nut(ø10mm) tightly and horizontally on a concrete or rigid mount.

§ When installing on the wall, roof or rooftop, anchor the mounting base securely with a nail or wire assuming the influence of wind and earthquake.

§ In the case when the vibration of the unit is conveyed to the hose, secure the unit with an anti-vibration rubber.



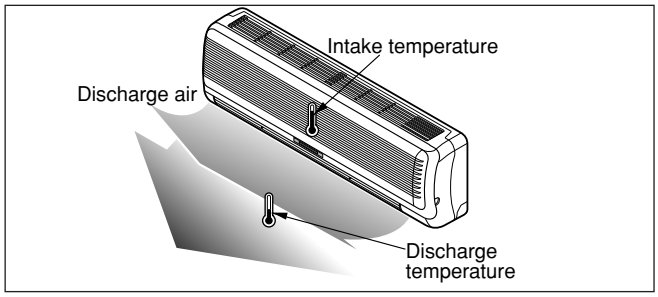
3. Evaluation of the performance

Operate unit for 15~20 minutes, then check the system refrigerant charge:

1. Measure the pressure of the gas side service valve.

2. Measure the temperature of the intake and discharge of air.

3. Ensure the difference between the intake temperature and the discharge is more than 8°C (Cooling) or reversely (Heating).



4. For reference; the gas side pressure of optimum condition is as below.(Cooling)

Outside ambient TEMP	The pressure of the gas side service valve
35°C(95°F)	4.5~5.5kg/cm^2 G(63.9~78.1 P.S.I.G.)

NOTE: If the actual pressure are higher than shown, the system is most likely over-charged, and charge should be removed. If the actual pressure are lower than shown, the system is most likely undercharged, and charge should be added.

The air conditioner is now ready for use.

PUMP DOWN

This is performed when the unit is to be relocated or the refrigerant circuit is serviced.

Pump Down means collecting all refrigerant in the outdoor unit without loss in refrigerant gas.

CAUTION:

Be sure to perform Pump Down procedure with the unit cooling mode.

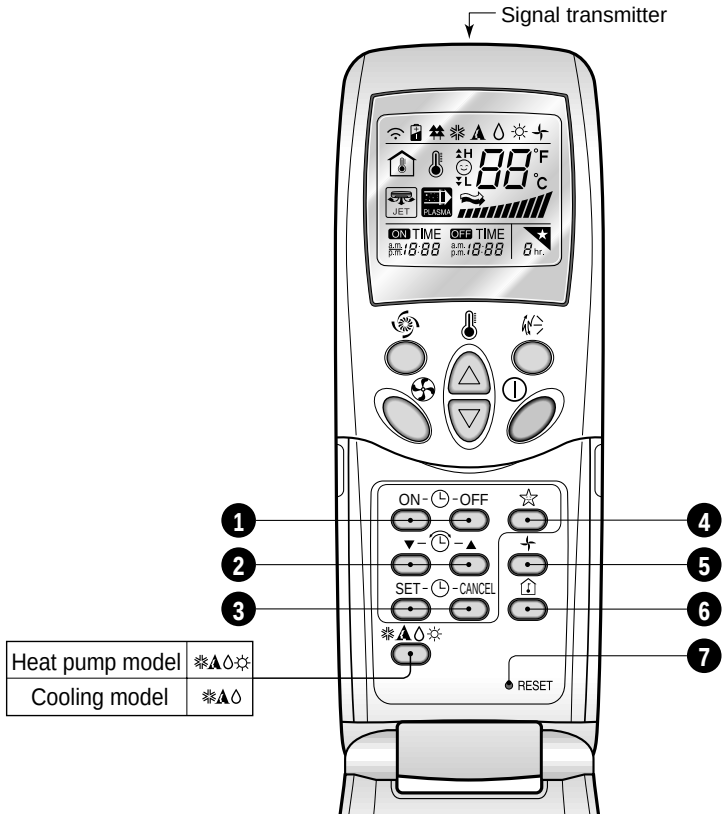
Pump Down Procedure

1. Connect a low-pressure gauge manifold hose to the charge port on the gas side service valve.
2. Open the gas side service valve halfway and purge the air from the manifold hose using the refrigerant gas.
3. Close the liquid side service valve(all the way in).
4. Turn on the unit's operating switch and start the cooling operation.
5. When the low-pressure gauge reading becomes 1 to 0.5kg/cm^2 G(14.2 to 7.1 P.S.I.G.), fully close the gas side valve stem and then quickly turn off the unit. At that time, Pump Down has been completed and all refrigerant gas will have been collected in the outdoor unit.

Operation

■ Name and Function-Remote Control

Remote Control



1 ON/OFF TIMER BUTTONS
Used to set the time of starting and stopping operation.

2 TIME SETTING BUTTONS
Used to adjust the time.

3 TIMER SET/CANCEL BUTTONS
Used to set the timer when the desired time is obtained and to cancel the Timer operation.

4 SLEEP MODE AUTO BUTTON
Used to set Sleep Mode Auto operation.

5 AIR CIRCULATION BUTTON
Used to circulate the room air without cooling or heating (turns indoor fan on/off).

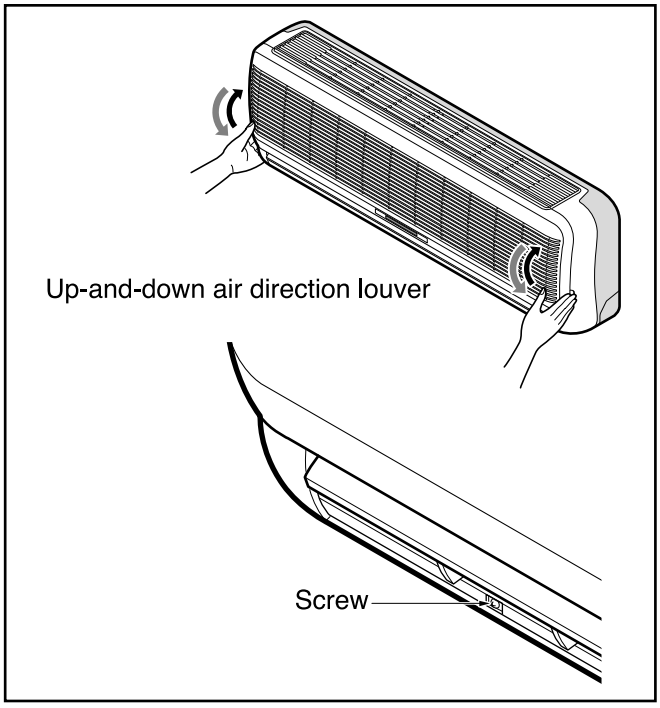
6 ROOM TEMPERATURE CHECKING BUTTON
Used to check the room temperature.

7 PLASMA(OPTION)
Used to start or stop the plasma-purification function.

8 RESET BUTTON
Used prior to resetting time or after replacing batteries.

Disassembly of the parts (Indoor unit)

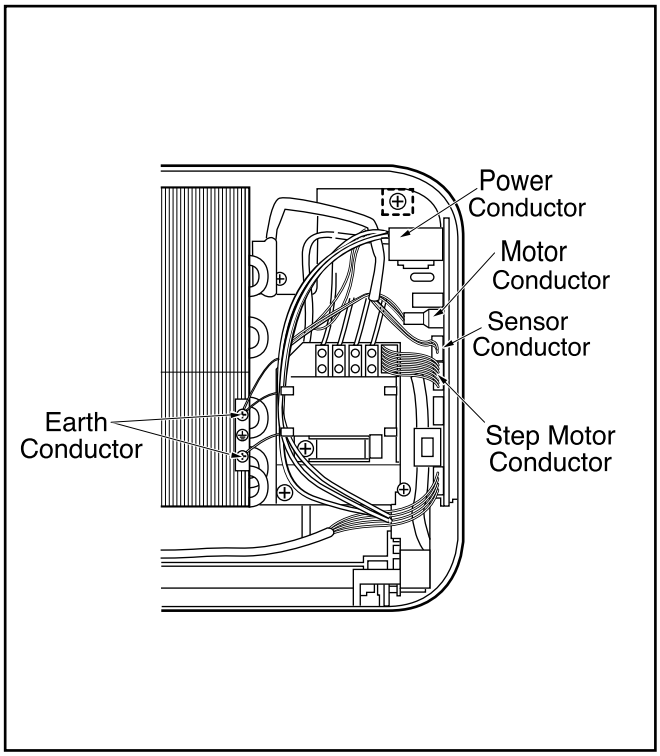
Warning :
Disconnect the unit from power supply before making any checks.
Be sure the power switch is set to “OFF”.



To remove the Grille from the Chassis.

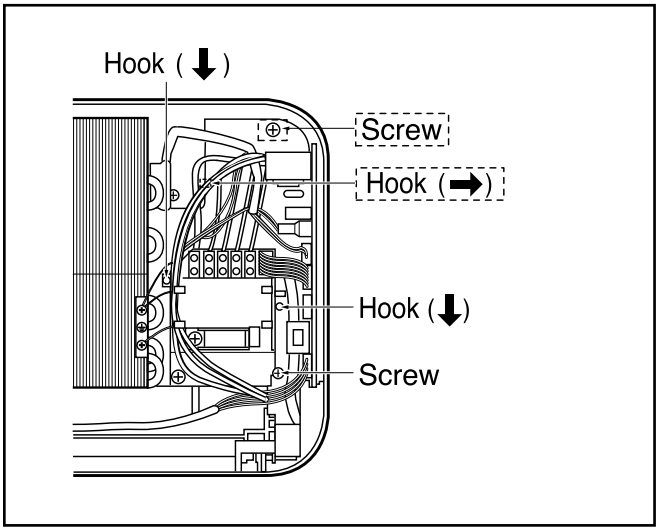
- Set the up-and-down air discharge louver to open position (horizontally) by finger pressure.
- Remove the securing screws
  (9K Btu models: 2EA, 12K Btu models: 3EA).
- To remove the Grille, pull the lower left and right side of the grille toward you (slightly tilted) and lift it straight upward.

1. To remove the sensor, housing connect, earth conductor & step motor conductor with sensor holder, Motor, Evaporator & P.C.B.



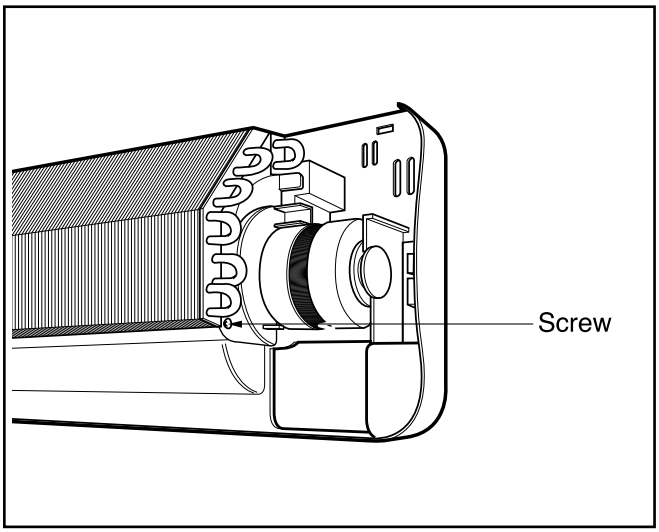
2. To remove the Control Box.

- Remove 2 or 4 securing screws.
- Pull the control box out from the chassis carefully.



3. To remove the Evaporator.

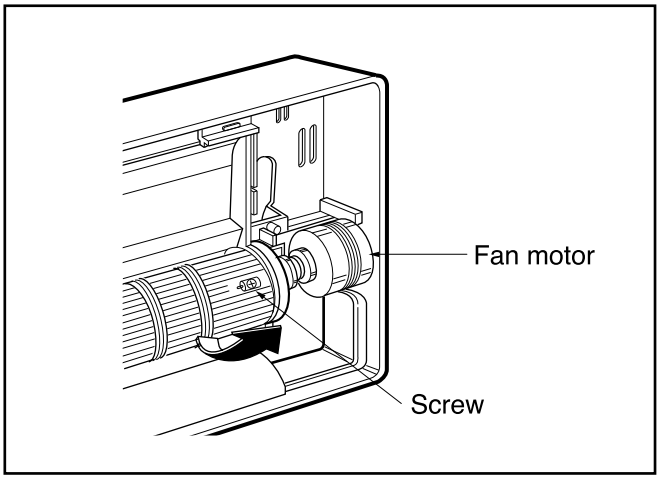
- Remove 3 screws securing the evaporator(at the left 1EA, at the right 2EA).
- Remove 3 screws securing the evaporator (at the left 2 EA, in the Eva Holder, at the right 1EA): only LS-J series



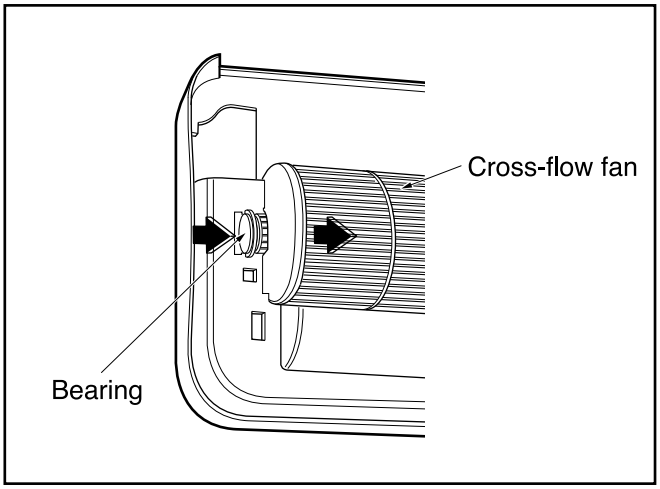
- Unhook the tab on the right inside of the chassis at the same time, slightly pull the evaporator toward you until the tab is clear of the slot.

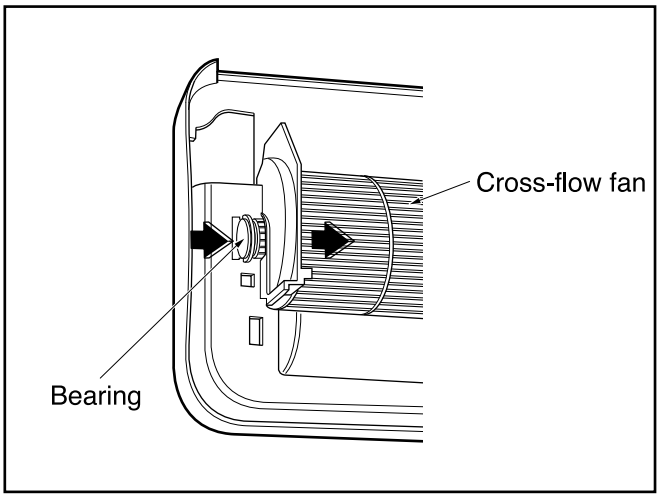
4. To remove the Cross-Flow Fan

- Loosen the screw securing the cross-flow fan to the fan motor (do not remove).
- Lift up the right side of the cross-flow fan and the fan motor, separate the fan motor from the cross-flow fan.

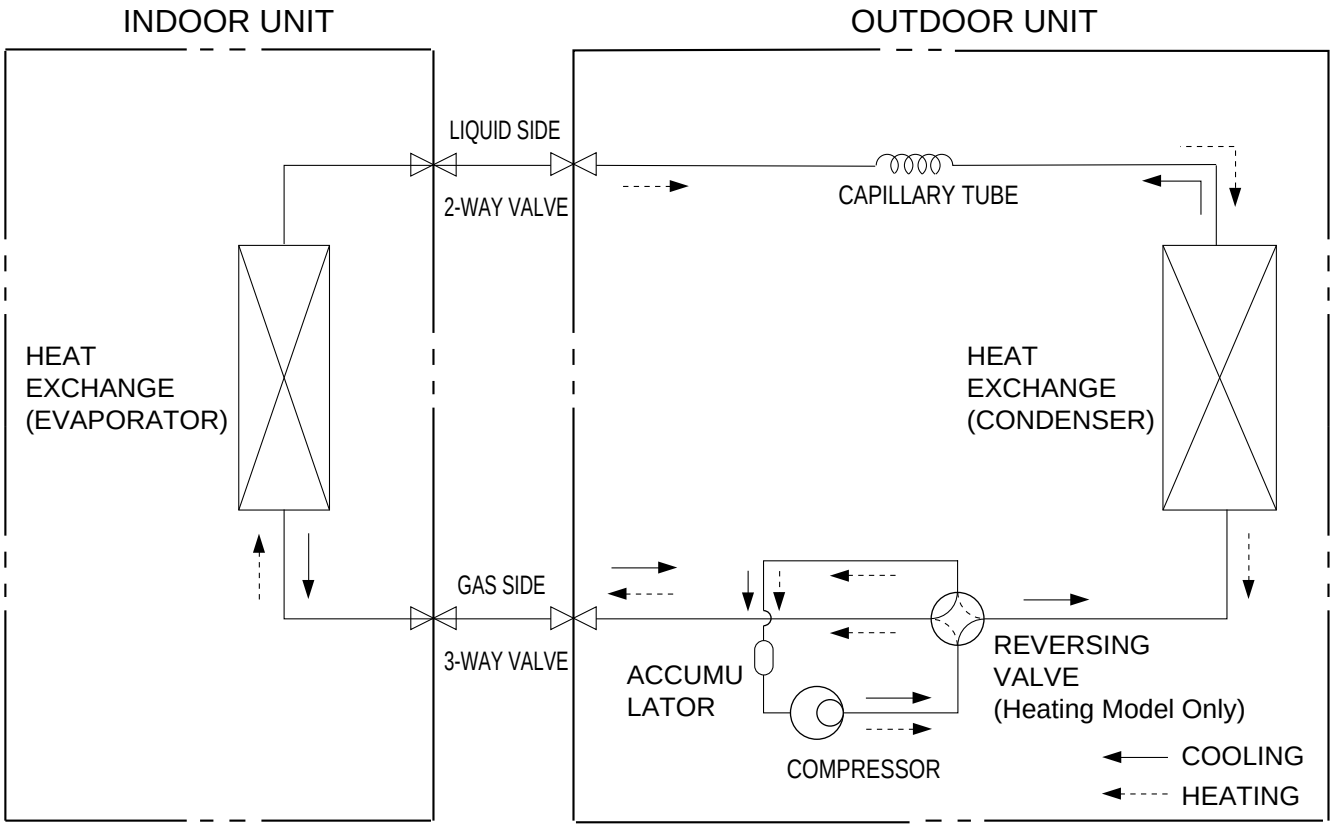


- Remove the left end of the cross-flow fan from the self-aligning bearing.





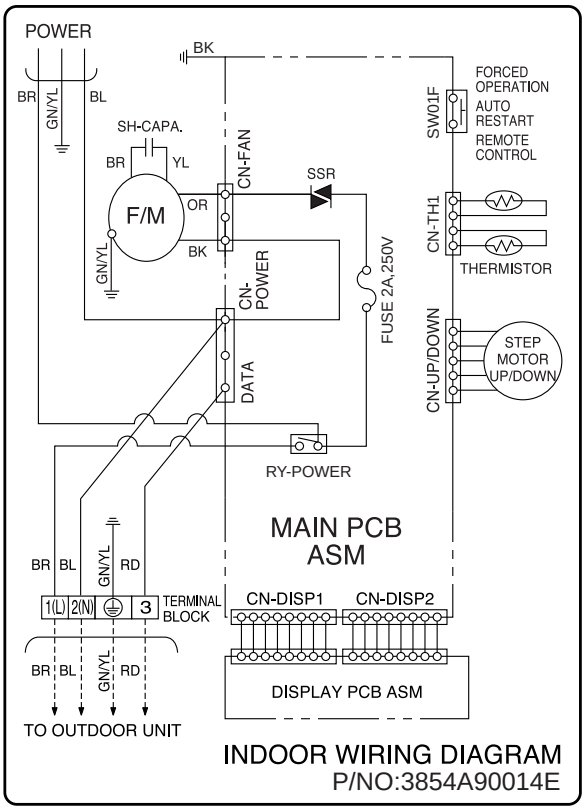
Refrigeration Cycle Diagram



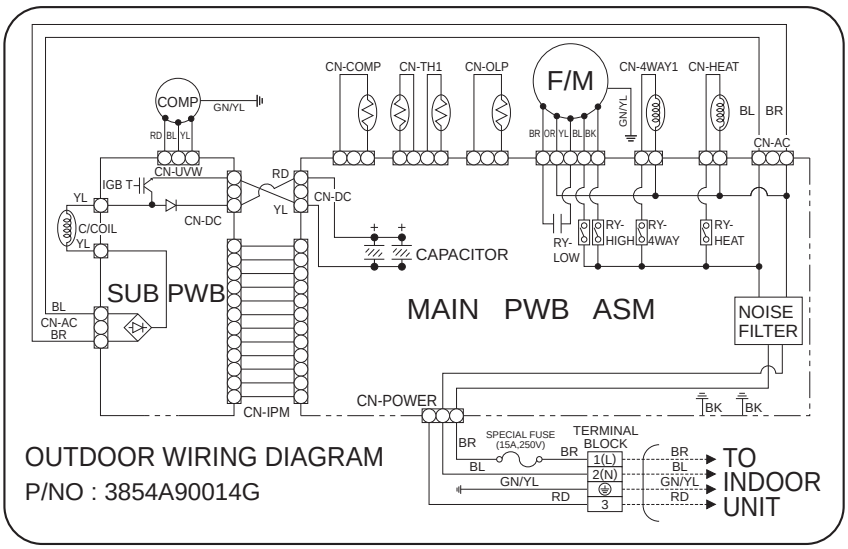
MODEL	Pipe size(Diameter:Ø)		MAX. Piping length (m)	Max Elevation (m)
	Gas(inch)	Liquid(inch)		
9k, 12k Btu SERIES	1/2"	1/4"	15	7

Wiring Diagram

(1) Indoor Unit



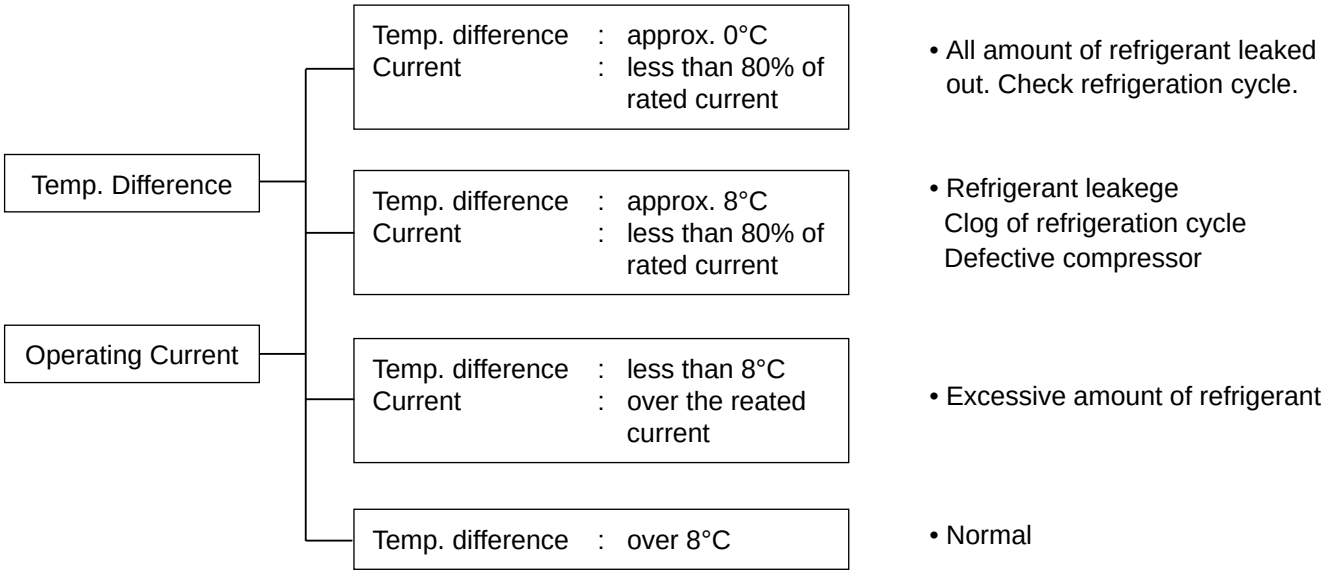
(2) Outdoor Unit



Cycle Troubleshooting Guide

Trouble analysis

1. Check temperature difference between intake and discharge air and operating current.


Temp. Difference
Operating Current
Temp. difference : approx. 0°C
Current : less than 80% of rated current
Temp. difference : approx. 8°C
Current : less than 80% of rated current
Temp. difference : less than 8°C
Current : over the reated current
Temp. difference : over 8°C
• All amount of refrigerant leaked out. Check refrigeration cycle.
• Refrigerant leakege
Clog of refrigeration cycle
Defective compressor
• Excessive amount of refrigerant
• Normal

Notice :
Temperature difference between intake and discharge air depends on room air humidity. When the room air humidity is relativery higher, temperature difference is smaller. When the room air humidity is relatively lower temperature difference is larger.

2. Check temperature and pressure of refrigeration cycle.

Suction pressure (Compared with the normal value)	Temperature (Compared with the normal valve)	Cause of Trouble	Description
Higher	High	Defective compressor Defective 4-way reverse valve	Current is low.
	Normal	Excessive amount of refrigerant	High pressure does not quickly rise at the beginning of operation.
Lower	Higher	Insufficient amount of refrigerant (Leakage) Clogging	Current is low. Current is low.

Notice :
1. The suction pressure is usually 4.0~6.0 kg/cm^{2}G(Cooling) at normal condition.
2. The temperature can be measured by attaching the thermometer to the low pressure tubing and wrap it with putty.

Self-diagnosis function

1. The malfunction indicator of indoor (see the operating LED of the INDOOR)

Error Code	The cause of malfunction	Malfunction indicator	The operating state
①	Indoor TH. is short or open.	The operating LED will be blinking once.	Keep operating state.
②	Outdoor TH. is short or open.	The operating LED will be blinking twice.	Keep operating state.
④	Outdoor OLP TH is short or open.	The operating LED will be blinking 4 times.	Restart compressor when OLP TH Temp is 74°C below.
⑤	Comunication error (serial comunication).	The operating LED will be blinking 5 times.	The operation is off(enable to restart by remote controller).
⑥	DC peak error.	The operating LED will be blinking 6 times.	Compressor will be turned off immediately.
⑦	Running current is overloaded.	The operating LED will be blinking 7 times.	Compressor will be turned off immediately.

✵ Error code ⑥, ⑦ can't be operated unless the power cord is removed.

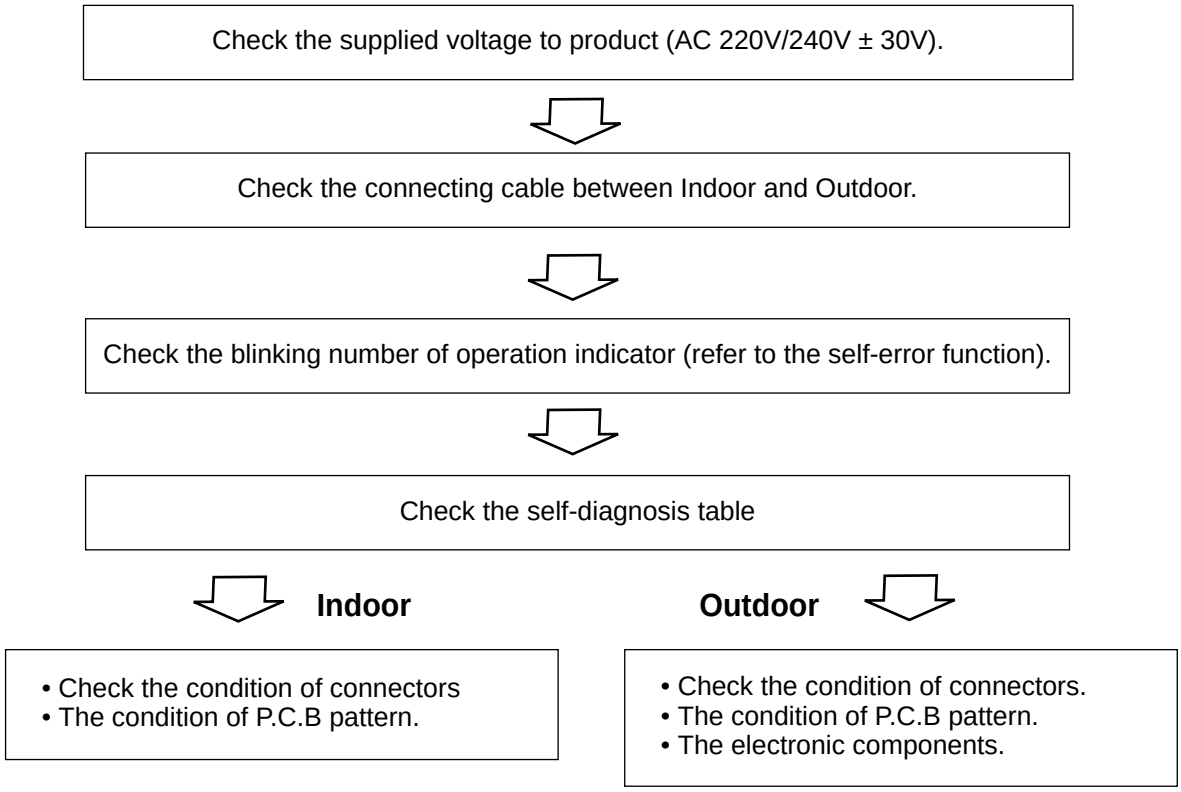
2. The malfunction indicator of outdoor (see the LED01M on the outdoor PCB ass'y)

Error Code	The cause of malfunction	Malfunction indicator	The operating state
②	Indoor TH. is short or open.	The LED01M will be blinking twice.	Keep operating state.
④	Outdoor OLP is open.	The LED01M will be blinking 4 times.	Restart comp. on in the OLP short state.
⑤	Comunication error (serial comunication).	The LED01M will be blinking 5 times.	The operation is off(enable to restart by remote controller).
⑥	DC peak error.	The LED01M will be blinking 6 times.	Compressor will be turned off immediately.
⑦	Running current is overloaded.	The LED01M will be blinking 7 times.	Compressor will be turned off immediately.
⑩	Comp. dome TH is short or open.	The LED01M will be blinking 10 times.	Compressor will be turned off immediately.

■ Precaution in Service or Check

Even after stopping the operation of product, it takes some time to discharge the remaining electricity of the electrolytic capacitor that was charged. Before starting a checking or repairing job, pull out the plug out of the outlet and make sure that the lamp on the control board outdoor unit is off.

■ The Diagnosis Procedure


Check the supplied voltage to product (AC 220V/240V ± 30V).
Check the connecting cable between Indoor and Outdoor.
Check the blinking number of operation indicator (refer to the self-error function).
Check the self-diagnosis table
Indoor
Outdoor
• Check the condition of connectors
• The condition of P.C.B pattern.
• Check the condition of connectors.
• The condition of P.C.B pattern.
• The electronic components.

Electronic Parts Troubleshooting Guide

※ Refer to electronic contorol device drawing & schematic diagram.

Trouble 1 The Product doesn't operate at all.

Turn off the main power and wait to 5 seconds

⇩

Turn on the main power again.

⇩

Does "Beeping" sound is made from the indoor unit?

NO

Check the voltage of power(AC220V/AC240V, 50Hz).

- The voltage of main power.
- The voltage applied to the unit.
- The connecting method of Indoor/Outdoor connecting cable (each color)
- The P.W.B. Ass'y

(Fuse, Noise Filter, Power Transformer, Bridge Diode, etc.)

YES

- Primarily, the operating condition of Micom is O.K.

⇩

- Check CN-DISP1
  CN-DISP2

The operation check of the P.C.B. Ass'y

Procedure	Specification	Remedy
1) The input voltage of power transformer.	1) AC230V ± 30V : Check the rated voltage	1) Replace power transfomer.
2) The output voltage of power transformer.	2) 14V ± 3V	2) Replace power transfomer.
3) IC01D(7812)	3) DC12V	3) Replace IC01D.
4) IC02D(7805)	4) DC5V	4) Replace IC02D.
5) IC01A(KIA7036)	5) The voltage of micom pin 29 : DC4.5V↑	5) Replace IC01A.

Trouble 2 Product doesn't operate with the remote controller.

Turn on main power.

While the compressor has been stopped, the compressor does not operate owing to the delaying function for 2 minutes after stopped.

When the compressor stopped Indoor Fan is driven by a low speed.
At this point the wind speed is not controlled by the remote controller.
(When operated in the Sleeping Mode, the wind speed is set to the low speed as force).)

Caused by the remote controller.

When the mark ( ) is displayed in LCD screen, replace battery.

When the detect switch (double key) inside the remote controller door is fault, it is impossible to operate temperature regulating(▲ / ▼) and wind speed selecting.

Check the connecting circuit between the remote controller MICOM(No.30)-R17(2Ω)-IR-LED-Tr-R16(2.2kΩ)

Caused by other parts except the remote controller

Check the contact of CN-DISP 1, 2 connector

Check DISP PWB Ass'y
-Voltage between CN1 ① - ⑦ : DC +5V

Check point
- Check the connecting circuit between MICOM PIN ㊾
- Check receiver ass'y

Trouble 3 The Compressor/Outdoor Fan are unable to drive.

Turn on the main power.

⇩

Operate Cooling Mode by setting the disired temperature of the remote controller is less than one of the Indoor temperature by 1°C at least.

⇩

When in air circulation mode, compressor/outdoor fan is stopped.

⇩

Check the sensor for Indoor temperature is attatched as close as to be effected by the themperature of Heat Exchange (EVA.)

⇩

When the sensor circuit for Indoor temperature and connector are in bad connection or are not engaged, Compressor/Outdoor fan is stopped.

- Check the related circuit of R02H(12.1K), R01H(1K), R04H(6.2K), R03H(1K), C01H(102), C02H(102), Micom(pin No. 62,63).
- Check the Indoor temperature sensor is disconnected or not (about 10K at 25°C).

⇩

Check the Relay(RY-PWR) for driving Compressor.

- Check the voltage between brown and blue cable of terminal to connect the Outdoor (About AC220V / 240V).
- Check the related circuit of relay in Outdoor PCB Ass'y.

Check Point	Comp. ON	Comp. OFF
Between Micom(No. 19) and GND	DC 5V	DC 0V
Between IC01M(No. 14) and GND	DC 1V↓	DC 12V

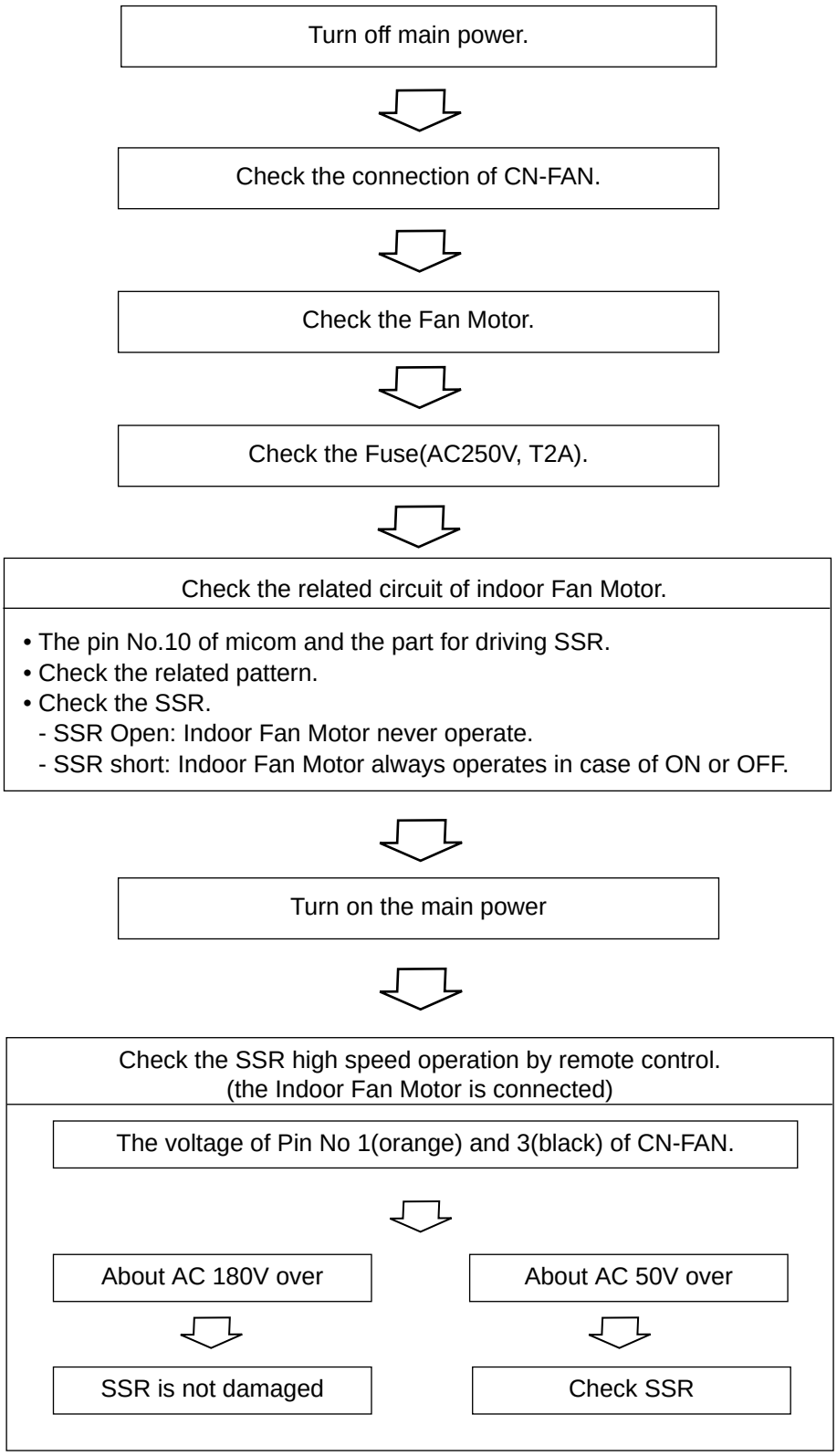
⇩

Turn off main power.

⇩

Check the electrical wiring diagram of Outdoor side.
Check the open or short of connecting wires between Indoor and Outdoor.

Trouble 4 When indoor Fan does not operate.


Turn off main power.
Check the connection of CN-FAN.
Check the Fan Motor.
Check the Fuse(AC250V, T2A).
Check the related circuit of indoor Fan Motor.
• The pin No.10 of micom and the part for driving SSR.
• Check the related pattern.
• Check the SSR.
- SSR Open: Indoor Fan Motor never operate.
- SSR short: Indoor Fan Motor always operates in case of ON or OFF.
Turn on the main power
Check the SSR high speed operation by remote control.
(the Indoor Fan Motor is connected)
The voltage of Pin No 1(orange) and 3(black) of CN-FAN.
About AC 180V over
About AC 50V over
SSR is not damaged
Check SSR

Trouble 5 When the vertical louver does not operate.

- Confirm that the vertical louver is normally geared with the shaft of Stepping Motor.
- If the regular torque is detected when rotating the vertical louver with hands ⇒ Normal

⇩

- Check the connecting condition of CN-U/D Connector
- Check the soldering condition(on PCB) of CN-U/D Connector

⇩

Check the operating circuit of the vertical louver

- Confirm that there is DC +12V between pin ① of CN-U/D and GND.
- Confirm that there is a soldering short at following terminals.
  - Between ①, ②, ③ and ④ of MICOM
  - Between ④, ⑤, ⑥ and ⑦ of IC01M
  - Between ⑩, ⑪, ⑫ and ⑬ of IC01M

⇩

If there are no problems after above checks.

- Confirm the assembly condition that are catching and interfering parts in the link of the vertical louver

Trouble 6 The Outdoor Unit does not operate at all.

Does the Operating LED of indoor unit blink when Operation's ON?

YES ⇨ Refer to the self-diagnosis function.

NO ⇩

Is the Connection between indoor power relay Pin ③ and terminal block No. 1 right?

NO ⇨ Check the connecting state of connector

YES ⇩

Is the connection of cable between indoor and outdoor unit right?

NO ⇨

Indoor	Outdoor
1(Brown)	1(Brown)
2(Blue)	2(Blue)
3(Green/YL)	3(Green/YL)
4(Red)	4(Red)

YES ⇩

Is the voltage of CN-POWER ①, ② in outdoor PCB Ass'y about AC220V / 240V when Operation's ON?

NO ⇨ Check the Fuse of Outdoor PCB Ass'y.

YES ⇩

Is the voltage of CN-AC ①, ③ in outdoor PCB Ass'y about AC220V / 240V?

NO ⇨ Check the PTC and RY-PWR.

YES ⇩

Is the Bridge Diode(DB01Z) right?

NO ⇨ Replace the Bridge Diode.

NO ⇩

Replace the PCB Ass'y.

Trouble 7-1 When compressor does not operate normally.

■ **DC Peak Error(Error Code ⑥)**

Does the LED01M of outdoor PCB Ass'y blink 6 times?

NO → Check the state of connecting cable (3 line) between indoor and outdoor uint.

YES ↓

Is the connecting state of connectors in outdoor Sub. PCB Ass'y right? (CN-UVW, CN-IPM)

NO → • Electrical wiring diagram (Colors)
• Check the connecting state of connectors in PCB Ass'y(Main/Sub)
• If CN-UWV is connected, the comprressor can be operated a opposite direction.

YES ↓

Is the power module in Sub PCB Ass'y right?

NO → • Check the short P-N P-U, V, W, and N-U, V, W of IPM and then collector, emiter of IGBT
• Replace the Sub PCB Ass'y.

YES ↓

Is the voltage of CN-AC over than AC170V?

NO → Check the supplied voltage.

YES ↓

Is the voltage of CN-DC over than about DC380V?

NO → • Check CN-IPM connector(Pin No. 12)
• Replace the Sub PCB Ass'y.

YES ↓

Is the refrigerant pressure right?

NO → Supply the refrigerant.

NO ↓

Replace the PCB Ass'y.

- Main PCB Ass'y
- Sub PCB Ass'y
- Control Box Ass'y

Trouble 7-2 When compressor does not oprate normally.

■ Communication error between Indoor and Outdoor (Error Code ⑤)

Does the operating LED in display PCB Ass'y blink 5 times?

NO → • Check the state of connecting cable (3 line) bewteen indoor and outdoor unit .
• Check Fuse, Noise Filter, PTC, etc.

YES ↓

Is the voltage of CN-POWER Pin No. 1,2 AC220/240V in Main PCB Ass'y.

NO → • Electrical wiring diagram(Colors)
• Check the connecting state of connectors in outdoor PCB Ass'y (Main/Sub)
• Check the Fuse of outdoor Control Box.

YES ↓

Is the voltage of CN-AC AC220/240V in SUB PCB Ass'y?

NO → • Check the connecting state of connectors in PCB Ass'y(Main/Sub).

YES ↓

Is the voltage of CN-DC over than DC350V?

NO → Replace the Sub PCB Ass'y.

YES ↓

Is the connection of CN-DATA between indoor and outdoor unit right?

NO → • Reconnect the cable to terminal block.
• Check the PCB pattern(Resoldering).

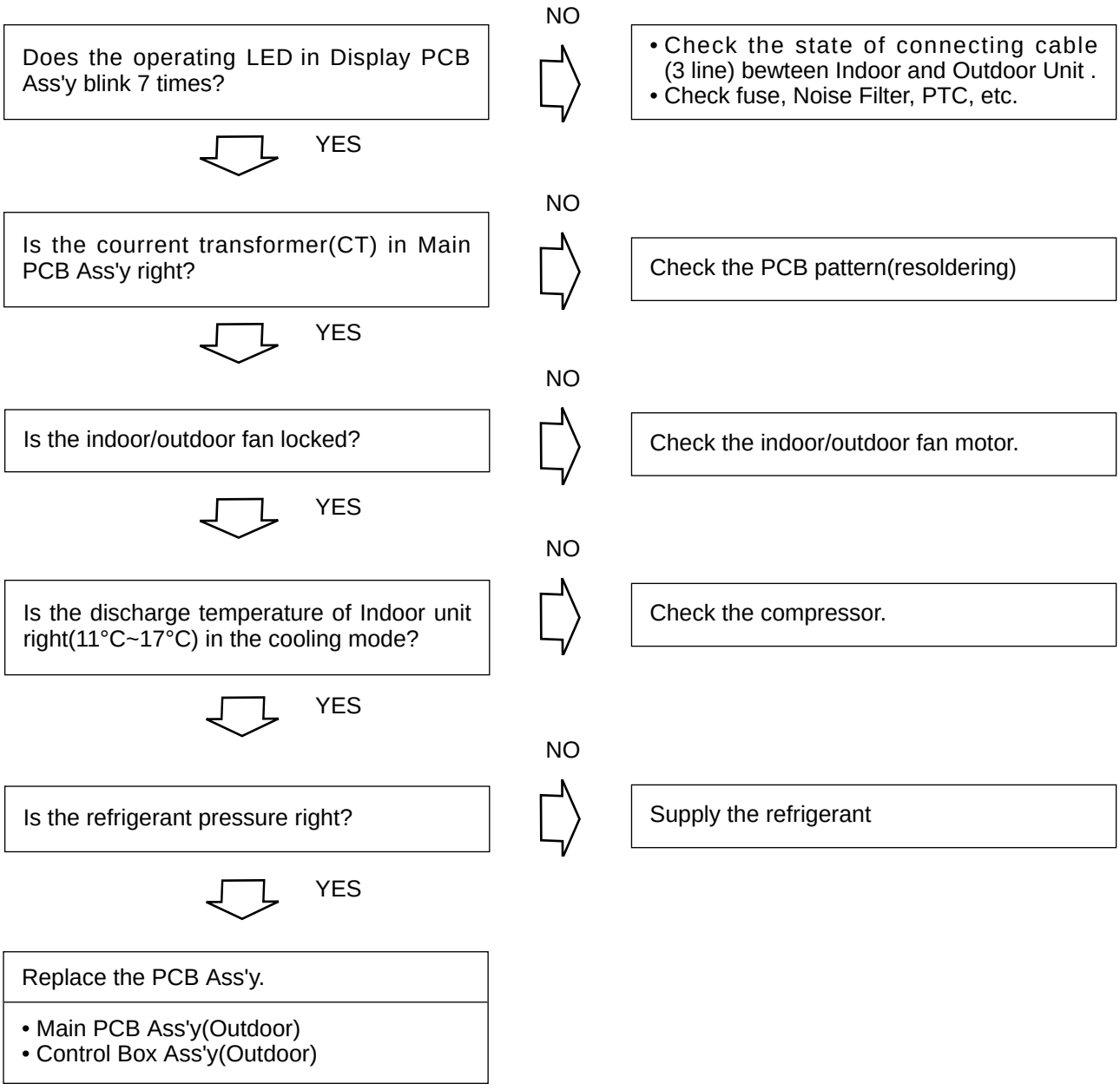
YES ↓

Replace the PCB Ass'y.

• Main PCB Ass'y (Indoor/Outdoor)
• Control Box Ass'y.

Trouble 7-3 When compressor does not oprate normally.

■ **CT Error (Error Code ⑦)**


Does the operating LED in Display PCB Ass'y blink 7 times?
NO
• Check the state of connecting cable (3 line) bewteen Indoor and Outdoor Unit .
• Check fuse, Noise Filter, PTC, etc.
YES
Is the courrent transformer(CT) in Main PCB Ass'y right?
NO
Check the PCB pattern(resoldering)
YES
Is the indoor/outdoor fan locked?
NO
Check the indoor/outdoor fan motor.
YES
Is the discharge temperature of Indoor unit right(11°C~17°C) in the cooling mode?
NO
Check the compressor.
YES
Is the refrigerant pressure right?
NO
Supply the refrigerant
YES
Replace the PCB Ass'y.
• Main PCB Ass'y(Outdoor)
• Control Box Ass'y(Outdoor)

■ The problem of missing the connector (INDOOR MAIN PCB ASSY)

Connectors	Condition	Problem (error mode)
CN-POWER (AC2)	OPEN	• Malfunctions all indoor & outdoor unit. • Malfunctions remocon, force, test operation mode.
CN-FAN	OPEN	• Malfunctions indoor fan motor.
CN-DATA	OPEN	• Malfunctions outdoor unit. • Stop compressor and outdoor fan motor. • The operation LED blinks 5 times. • Communicaion error.
CN-DISP1	OPEN	• Malfunctions remote contoller. • Don't operate the power display module.
CN-DISP2	OPEN	• Don't operate the power display module.
CN-TH	OPEN/SHORT	• The operation LED blinks twice. • Enable to receive remote singnal.
CN-U/D	OPEN	• Malfunctions UP/DOWN step motor. • Don't operate louver.

■ The problem of missing the connector (OUTDOOR MAIN PCB ASSY)

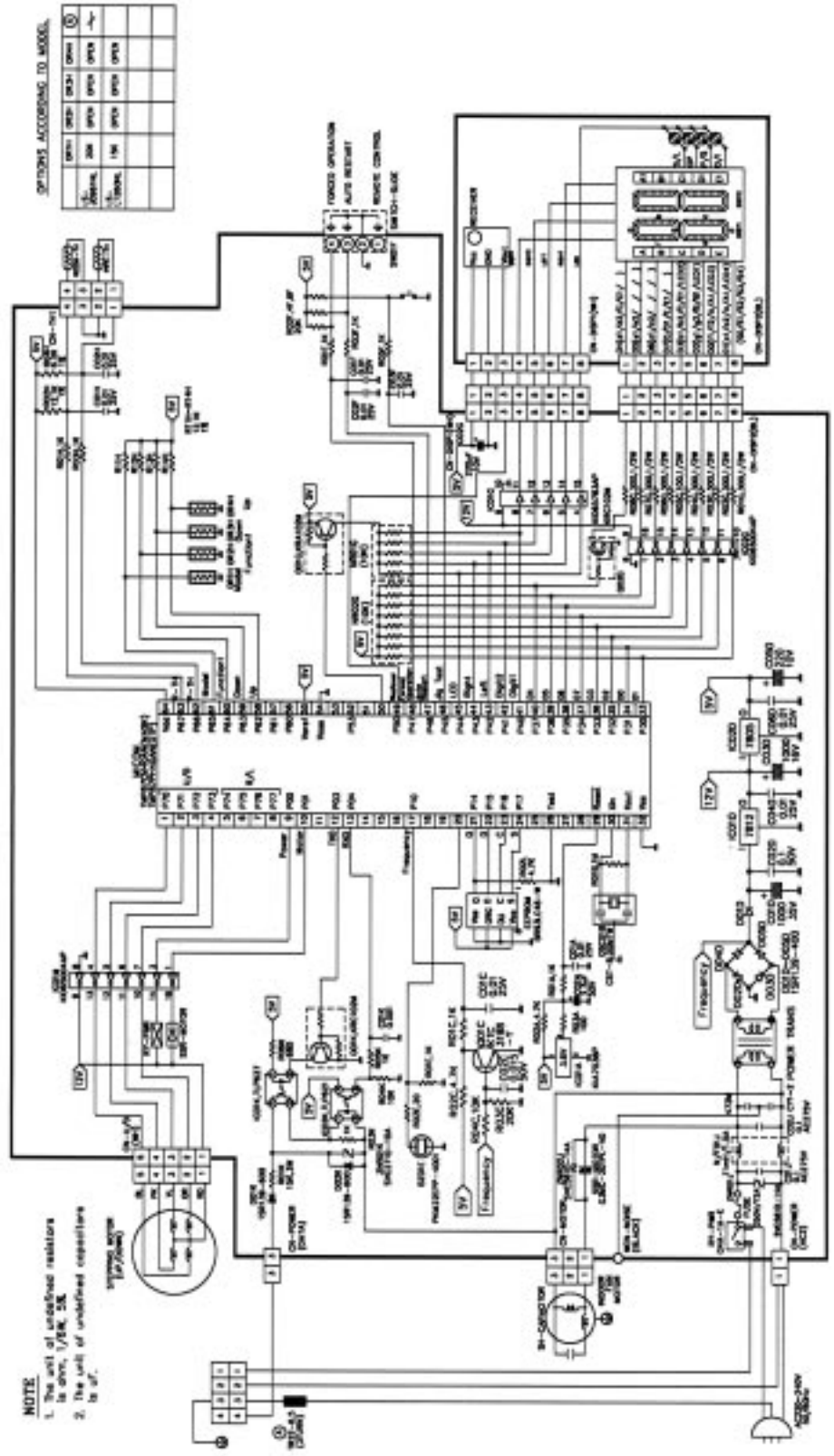
Connectors	Condition	Problem (error mode)
CN-POWER	OPEN	• Malfunctions outdoor unit. • Stop compressor and outdoor fan. • The operation LED blinks 5 times.
CN-AC	OPEN	• Malfunctions outdoor unit. • Stop compressor and outdoor fan. • The operation LED blinks 5 times.
CN-DC	OPEN	• Malfunctions outdoor unit. • Stop compressor and outdoor fan. • The operation LED blinks 5 times.
CN-IPM	OPEN	• Malfunctions PFC & inverter circuit. • Stop compressor and outdoor fan.
CN-GND1,2	OPEN	• Malfunctions EMI /EMS
CN-HEAT	OPEN	• Malfunctions Sump Heater
CN-4WAY	OPEN	• Malfunctions 4-WAY valve.
CN-FAN	OPEN	• Malfunctions fan.
CN-OLP	OPEN/SHORT	• Malfunctions Comp. Motor. • The operation LED blinks 4 times. • The LED01K blinks 4 times.
CN-TH	OPEN/SHORT	• The operation LED blinks twice. • The LED01K blinks twice.
CN-COMP	OPEN/SHORT	• The LED01K blinks 10 times. • Continue Comp. operation. (when the discharge pipe TH opens) • Stop Comp. operation (when the discharge pipe TH shorts)

■ The problem of missing the connector (SUB PCB ASSY)

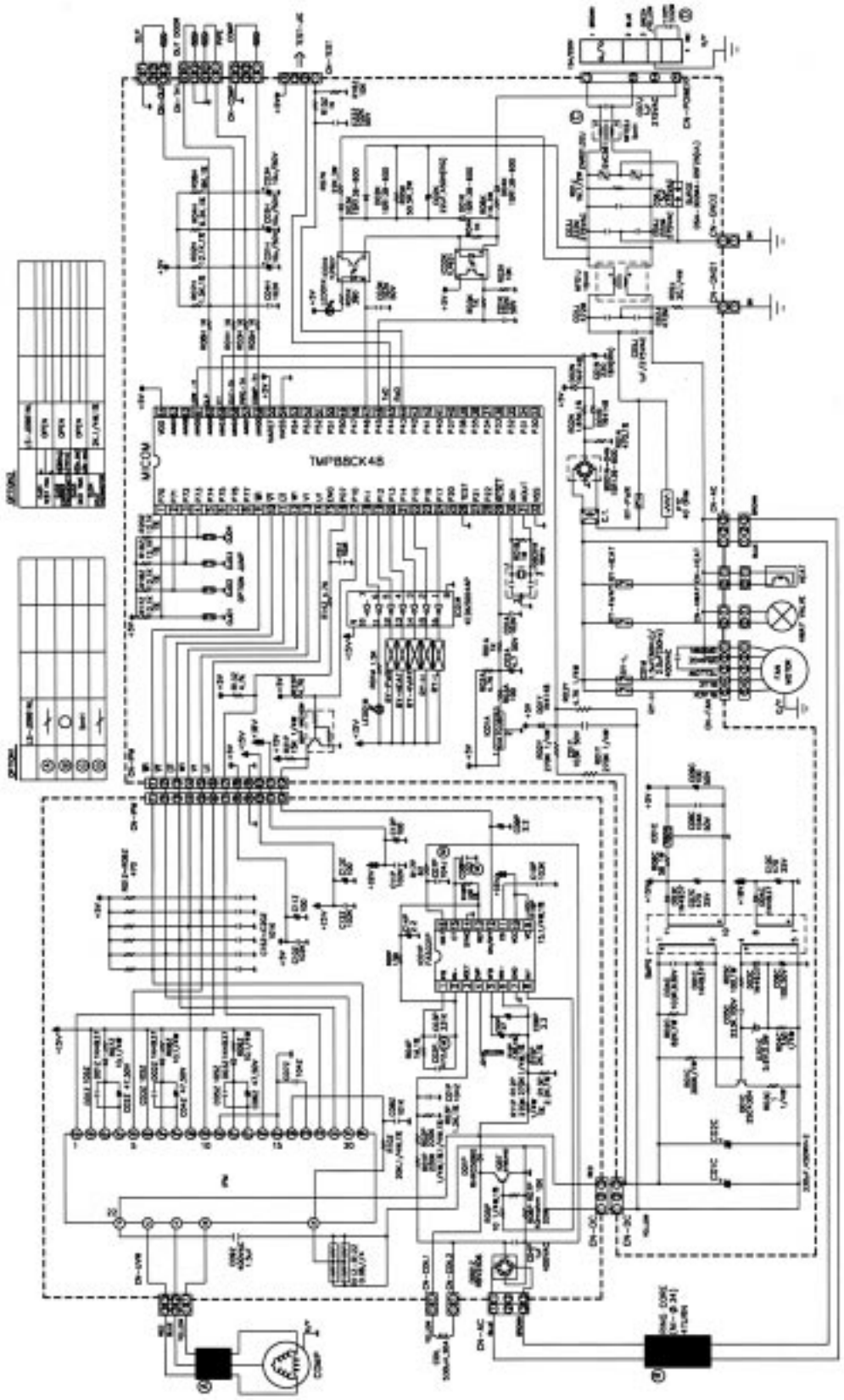
Connectors	Condition	Problem (error mode)
CN-UVW	OPEN	• Stop compressor.
CN-AC	OPEN	• Malfunctions outdoor unit. • Stop compressor and outdoor fan. • The operation LED blinks 5 times.
CN-DC	OPEN	• Malfunctions outdoor unit. • Stop compressor and outdoor fan. • The operation LED blinks 5 times.
CN-IPM	OPEN	• Malfunctions PFC & inverter circuit. • Stop compressor and outdoor fan.

Schematic Diagram

9k, 12k Series(Indoor)



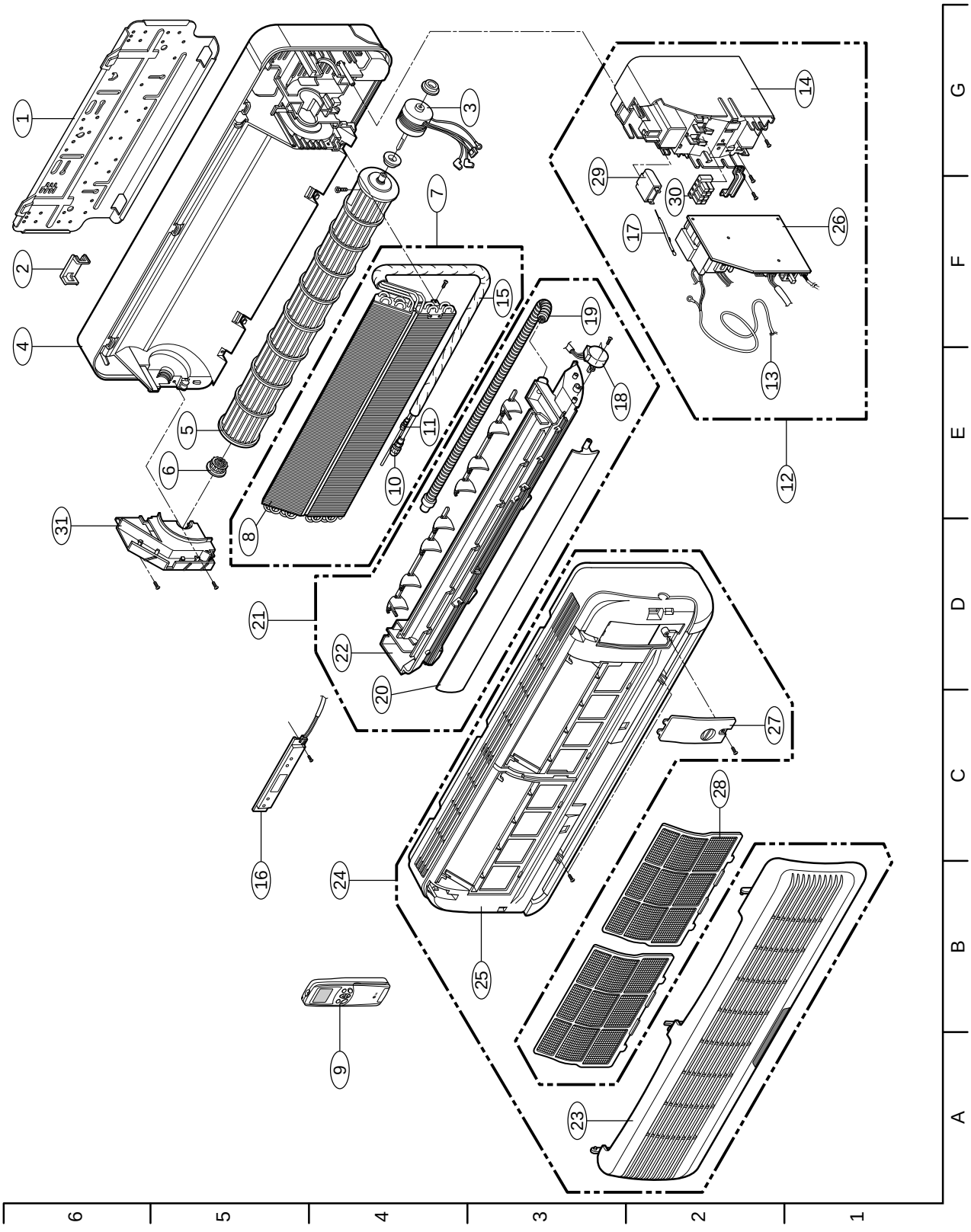
9k, 12k Series(Outdoor)



Exploded View & Replacement Parts List

1. Indoor Unit

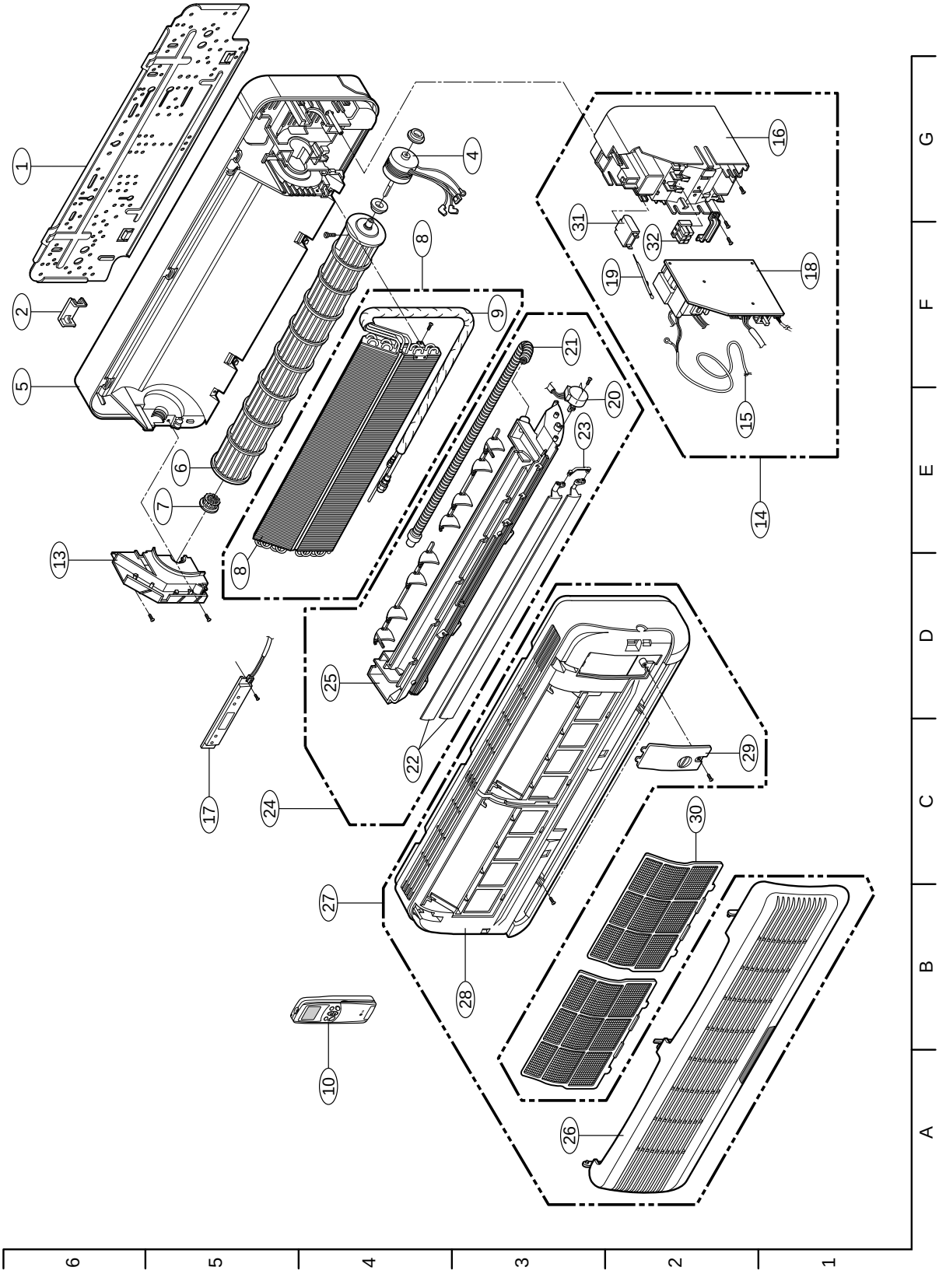
(1) LS-J0961NL/NT



Parts List (LS-J0961NL/NT)

NO.	PART NO.	PART NAME	Q/TY		REMARKS
			LS-J0961NL	**LS-J0961NT**	
1	3300AR1002A	PLATE INSTALLATION	1	1	R
2	3H03651A	HOLDER, TUBE	1	1	
3	4681A20003C	MOTOR, BLOWER	1	1	R
4	3141A20001	CHASSIS ASM	1B	1A	R
5	5901AR6141A	CROSS FLOW FAN	1	1	R
6	3H02821A	BEARING ASM	1	1	R
7	5421AR6176E	EVAPORATOR ASM	1	1	R
8	5421AR6175A	EVAPORATOR	1	1	R
9	6711A20010	REMOTE CONTROL ASM	1B	1G	R
10	3H01420A	SOCKET FLARE	1	1	
11	3A00375D	SOCKET FLARE	1	1	
12	4995A20015N	CONTROLLER ASSY	1	1	R
13	2H00511	POWER CORD ASSY	1R	-	
	6411A20006	POWER CORD ASSY	1C	-	
14	4994AR0011A	CONTROL BOARD	1	1	R
15	5211AR7288B	TUBING ASM	1	1	R
16	6871A30016A	PWB(PCB) ASSY, DISPLAY	1	1	R
17	6323AQ2333A	THERMISTEOR ASSY	1	1	R
18	4681AR2727H	STEPPING MOTOR	1	1	R
19	5251AR2575A	DRAIN HOSE ASM	1	1	R
20	5990AR7225A	VANE	1	1	R
21	3531A10005D	DISCHARGE GRILLE ASM	1	1	R
22	5008AR1573A	DISCHARGE GRILLE	1	1	
23	3531A20003	INLET GRILLE	1P	1P	R
24	3531A10001	FRONT GRILLE ASM	1T	-	R
25	3530AR1576A	FRONT GRILLE	1	1	R
26	6871A20062A	PWB(PCB)ASSY, MAIN	1	1	R
27	3550AR3724B	COVER CONTROL	1	1	R
28	5230AR2630A	FILTER ASSY	2	2	R
29	3H01487A	SH CAPACITOR	1	1	R
30	6640AR7043B	PILLAR TERMINAL	1	1	
31	4930AR6138A	HOLDER, EVA	1	1	R

(2) LS-L1260NL/NT

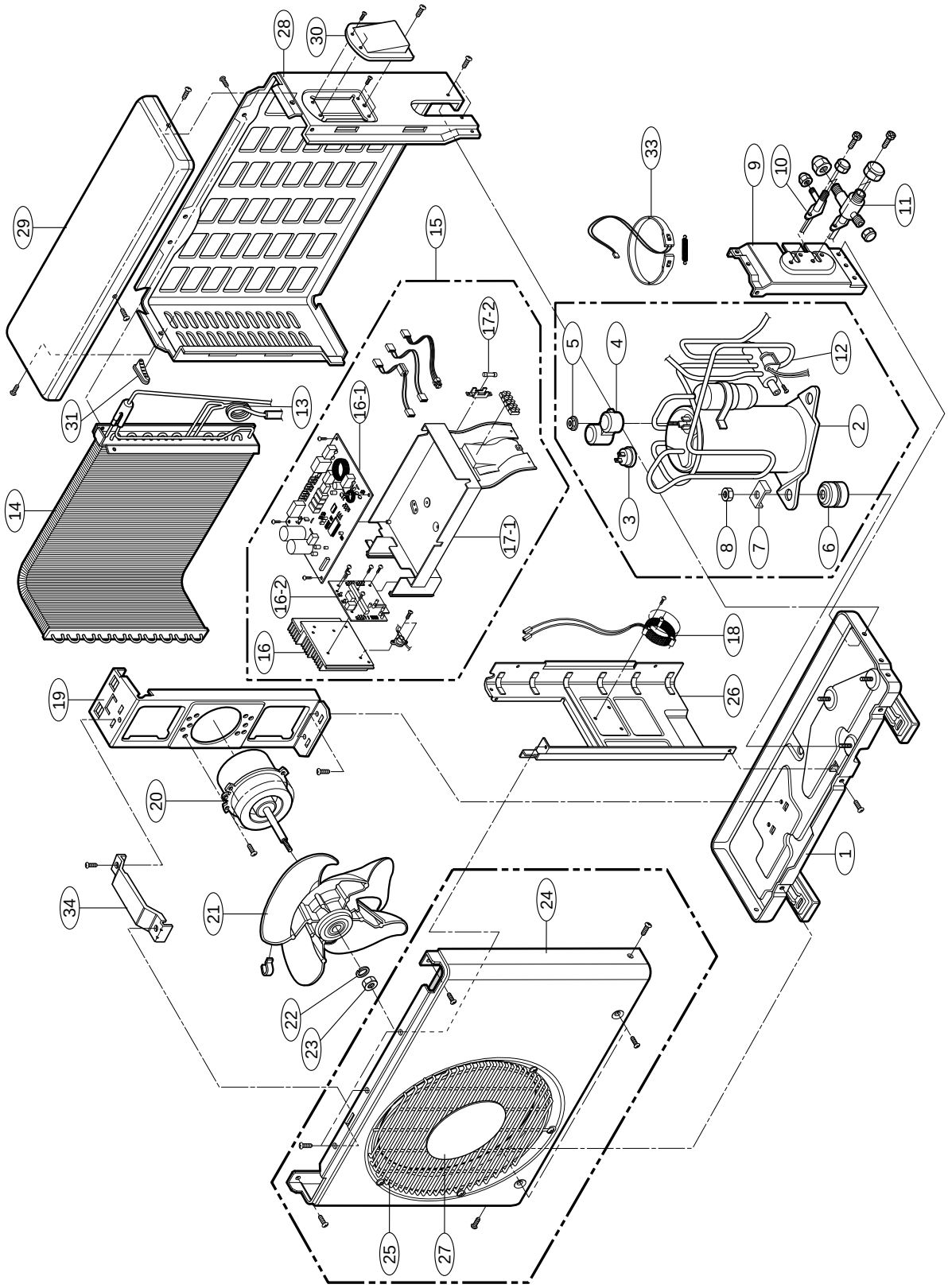


Parts List (LS-L1260NL/NT)

NO	PART NO.	PART NAME	Q/TY		REMARKS
			LS-L1260NL	LS-L1260NT	
1	1H00843A	PLATE INSTALLATING	1	1	R
2	4930AR4181A	HOLDER, TUBE	1	1	
4	4681A20003P	MOTOR ASSY BLOWER	1	1	R
5	3141A20003	CHASSIS ASSY	1D	1B	R
6	5901AR6141B	BLOWER ASSY	1	1	R
7	3H02821B	BEARING ASSY	1	1	R
8	5421A20031E	EVAPORATOR ASSY, FINAL	1	1	
	5421A20032A	EVAPORATOR ASSY	1	1	R
9	2H02449C	TUBE ASSY	1	1	R
10	6711A20010	REMOTE CONTROLLER ASM	1B	1G	R
11	3H01420A	BOLT, SOCKET FLARE	1	1	
13	4930AR6138A	HOLDER EVA	1	1	R
14	4995A20015P	CONTROLLER ASSY	1	1	R
15	2H00511U	POWER CORD ASSY	1		
	6411A20006E	POWER CORD ASSY		1	
16	4994A30001A	CONTROL BOX	1	1	
17	6871A30016A	DISPLAY ASSY	1	1	R
18	6871A20062C	PWB ASSY, MAIN	1	1	R
19	6323AQ2333A	THERMISTOR ASSY	1	1	R
20	4681AR2727H	STEPPING MOTOR	1	1	R
21	5251AR2575A	DRAIN ASSY	1	1	R
22	5990A30006A	VANE	1	1	
	5990A30007A	VANE	1	1	
23	4520A30010A	LINK	1	1	R
24	3531A10023B	DISCHARGE GRILLE ASSY	1	1	
25	3530A10018A	DISCHARGE GRILLE	1	1	
26	3531AR2980G	GRILLE, ASSY, INLET	1	1	R
27	3531A10024	GRILLE ASSY, FRONT	1G	1H	R
28	3530A10020B	GRILLE, FRONT	1	1	R
29	3550A30035B	COVER, CONTROL	1	1	
30	5230AR2672A	FILTER, AIR	2	2	R
31	3H01487A	SH-CAPACI TOR	1	1	R
32	6640AR7043B	PILLAR TERMINAL	1	1	

2. Outdoor unit

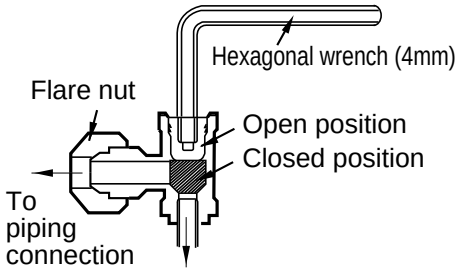
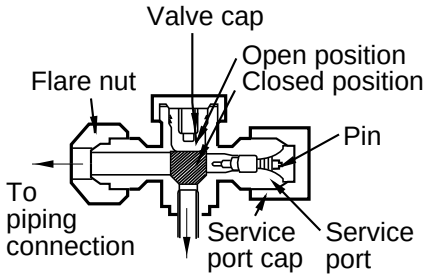
LS-J0961NL/NT, LS-L1260NL/NT



Parts List (LS-J0961NL/NT, LS-L1260NL/NT)

No.	PART No.	PARTS NAME	Q,TY				REMARK
			LS-J0961NL	LS-J0961NT	LS-L1260NL	LS-L1260NT	
1	2H02079S	BASE PAN W. ASM	1	1	1	1	
2	5416A20008A	COMPRESSOR	1	1			R
	5416A20003F	COMPRESSOR			1	1	R
3	6323A20001B	SENSOR ASSY	1	1	1	1	R
4	3550U-L002E	TERMINAL COVER	1	1	1	1	R
5	4H00947A	NUT TERMINAL COVER	1	1	1	1	
6	4H00982E	ANTI VIBRATION BUSH	3	3	3	3	R
7	4810AR4155A	WASHER	3	3	3	3	R
8	1NHA0801206	HEXAGON NUT-1	3	3	3	3	
9	2H02019B	SUPPORT VALVE	1	1	1	1	R
10	2H02200A	SERVICE VALVE	1	1	1	1	R
11	2H02150A	SERVICE VALVE	1	1	1	1	R
12	5211A20164A	REVERSING VALVE ASSY	1	1			
	5211A20048A	REVERSING VALVE ASSY			1	1	R
	3A02027E	REVERSING VALVE	1	1	1	1	R
	6141AR3733M	REVERSING VALVE COIL	1	1	1	1	R
13	5211A20036A	CAPILLARY FINAL ASM	1	1		1	R
	5211A20047B	CAPILLARY FINAL ASM			1	1	R
14	5403AR6026	CONDENSER ASM	1F/1E	1F/1E			R
	5403AR6027	CONDENSER ASM			1M/1L	1M/1L	R
15	4995A10003	CONTROL BOX ASSY	1C	1C	1D	1D	R
16-1	6871A20068	MAIN PCB ASSY	1A	1A	1C	1C	R
16-2	6871A20013	SUB PCB ASSY	1C	1C	1C	1C	R
16-3	4920A30002A	HEAT SINK	1	1	1	1	
17	4994A10002A	CONTROL BOX	1	1	1	1	R
	0FT1502B621	SPECIAL FUSE	1	1	1	1	R
18	6140A90002B	ACTIVE FILTER(CHOCK)	1	1	1	1	R
19	2H02003A	MOUNT, MOTOR	1	1	1	1	R
20	4681AR1392N	MOTOR, FAN	1	1	1	1	R
21	5900AR1119B	FAN	1	1	1	1	R
22	1WPA0800014	PLAIN WASHER	1	1	1	1	
23	4H02861A	FAN NUT	1	1	1	1	R
24	2H02674Q	FRONT PANEL ASSY	1	1	1	1	R
25	1H00840C	DISCHARGE GRILLE	1	1	1	1	R
26	4791AR7047	BARRIER ASSY	1E	1E	1E	1E	R
27	2H02385P	COVER GRILLE	1	1	1	1	
28	1H00697F	REAR PANEL	1	1	1	1	R
29	3H03465D	TOP COVER ASM	1	1	1	1	R
30	3551AR7184L	COVER CONTROL ASM	1	1	1	1	R
31	3H03168A	HANDLE	1	1	1	1	
33	2H01440	HEAT, SUMP	1B	1B	1C	1C	R
34	3H03147A	BRACKET, MOTOR	1	1	1	1	

2-way, 3-way Valve

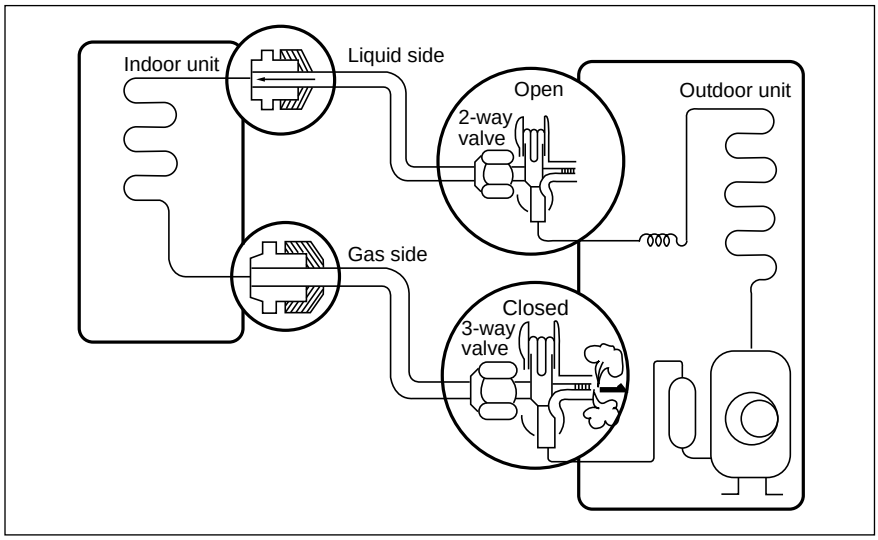
		2-way Valve (Liquid Side)	3-way Valve (Gas Side)	
		 To outdoor unit	 To outdoor unit	
	Works	Shaft position	Shaft position	Service port
	Shipping	Closed (with valve cap)	Closed (with valve cap)	Closed (with cap)
1.	Air purging (Installation)	Open (counter-clockwise)	Closed (clockwise)	Open (push-pin or with vacumm pump)
	Operation	Open (with valve cap)	Open (with valve cap)	Closed (with cap)
2.	Pumping down (Transfering)	Closed (clockwise)	Open (counter-clockwise)	Open (connected manifold gauge)
3.	Evacuation (Servicing)	Open	Open	Open (with charging cylinder)
4.	Gas charging (Servicing)	Open	Open	Open (with charging cylinder)
5.	Pressure check (Servicing)	Open	Open	Open (with charging cylinder)
6.	Gas releasing (Servicing)	Open	Open	Open (with charging cylinder)

1. Air purging

Required tools : hexagonal wrench, adjustable wrench, torque wrenches, wrench to hold the joints, and gas leak detector.

The additional gas for air purging has been charged in the outdoor unit.
However, if the flare connections have not be done correctly and there gas leaks, a gas cylinder and the charge set will be needed.

The air in the indoor unit and in the piping must be purged. If air remains in the refrigeration pipes, it will affect the compressor, reduce to cooling capacity, and could lead to a malfunction.



Service port nut:
Be sure, using a torque wrench to tighten the service port nut (after using the service port), so that it prevents the gas leakage from the refrigeration cycle.

*** CAUTION : Do not leak the gas in the air during Air purging.**

• Procedure

(1) Recheck the piping connections.

(2) Open the valve stem of the 2-way valve counterclockwise approximately 90°, wait 10 seconds, and then set it to closed position.
- Be sure to use a hexagonal wrench to operate the valve stem.

(3) Check for gas leakage.
- Check the flare connections for gas leakage.

(4) Purge the air from the system.
- Set the 2-way valve to the open position and remove the cap from the 3-way valve's service port.
- Using the hexagonal wrench to press the valve core pin, discharge for three seconds and then wait for one minute. Repeat this three times.

(5) Use torque wrench to tighten the service port nut to a torque of 1.8kg.cm.

(6) Set the 3-way valve to the back seat.

(7) Mount the valve stem nuts to the 2-way and 3-way valves.

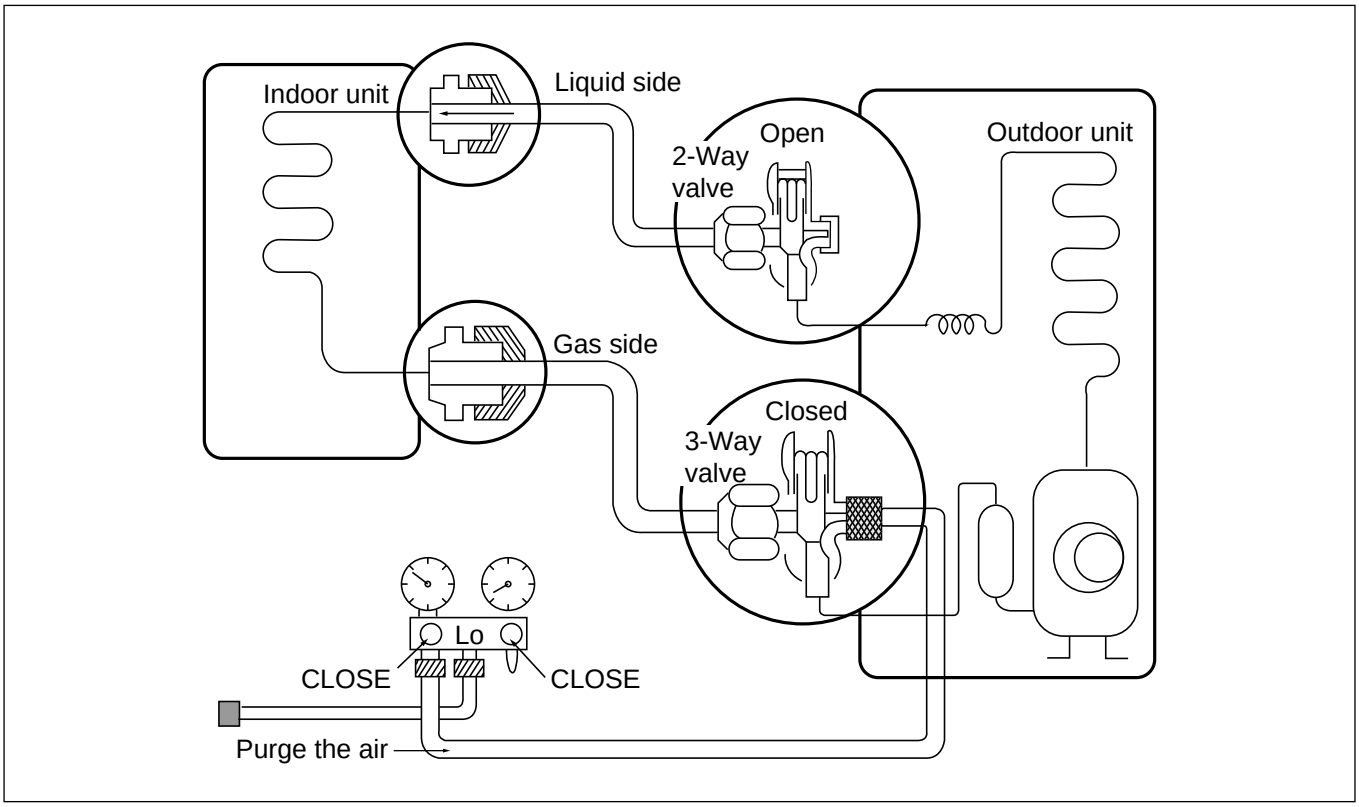
(8) Check for gas leakage.
- At this time, especially check for gas leakage from the 2-way and 3-way valve's stem nuts, and from the service port nut.

Caution

If gas leakage are discovered in step (3) above, take the following mesures :

If the gas leaks stop when the piping connections are tightened further, continue working from step (4).
If the gas leaks do not stop when the connections are retightened, repair the location of the leak, discharge all of the gas through the service port, and then recharge with the specified amount of gas from a gas cylinder.

2. Pumping down



• Procedure

(1) Confirm that both the 2-way and 3-way valves are set to the open position.
- Remove the valve stem caps and confirm that the valve stems are in the raised position.
- Be sure to use a hexagonal wrench to operate the valve stems.

(2) Operate the unit for 10 to 15 minutes.

(3) Stop operation and wait for 3 minutes, then connect the charge set to the service port of the 3-way valve.
- Connect the charge hose with the push pin to the service port.

(4) Air purging of the charge hose.
- Open the low-pressure valve on the charge set slightly to air purge from the charge hose.

(5) Set the 2-way valve to the closed position.

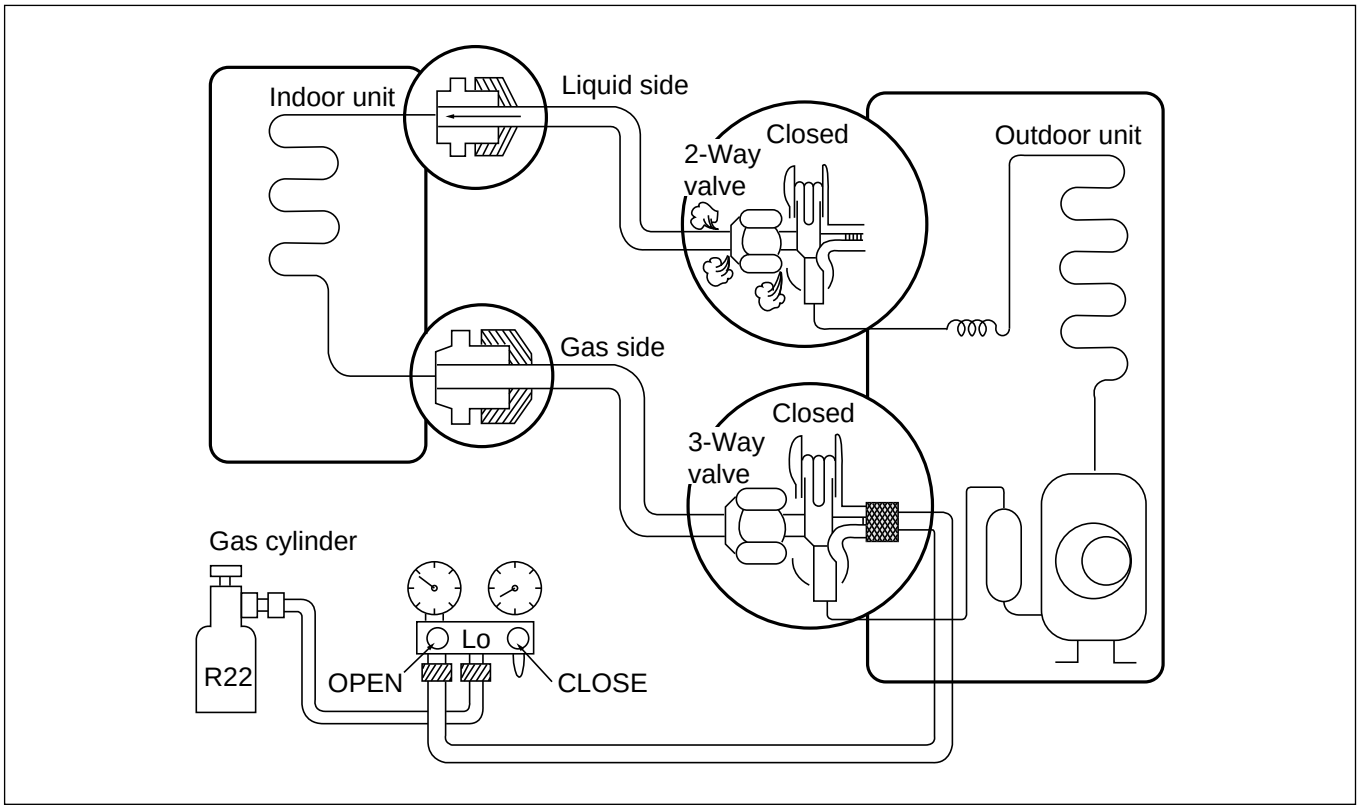
(6) Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 1kg/cm²g.

(7) Immediately set the 3-way valve to the closed position.
- Do this quickly so that the gauge ends up indicating 3 to 5kg/cm²g.

(8) Disconnect the charge set, and mount the 2-way and 3-way valve's stem nuts and the service port nut.
- Use torque wrench to tighten the service port nut to a torque of 1.8 kg.m.
- Be sure to check for gas leakage.

1) Re-air purging

(Re-installation)



• Procedure

(1) Confirm that both the 2-way valve and the 3-way valve are set to the closed position.

(2) Connect the charge set and a gas cylinder to the service port of the 3-way valve.
- Leave the valve on the gas cylinder closed.

(3) Air purging.
- Open the valves on the gas cylinder and the charge set. Purge the air by loosening the flare nut on the 2-way valve approximately 45° for 3 seconds then closing it for 1 minute; repeat 3 times.
- After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.

(4) Check for gas leakage.
- Check the flare connections for gas leakage.

(5) Discharge the refrigerant.
- Close the valve on the gas cylinder and discharge the refrigerant until the gauge indicates 3 to 5 kg/cm^{2}g.

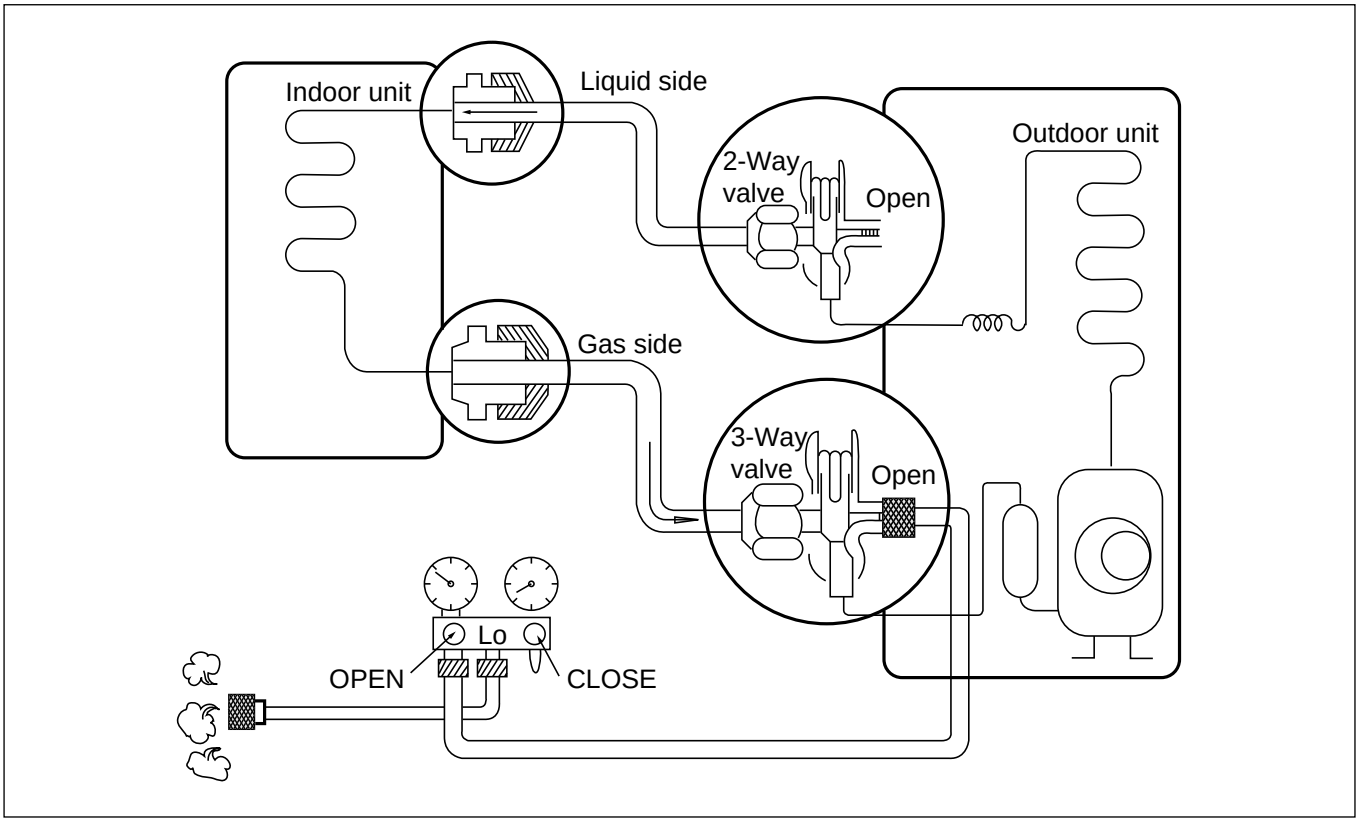
(6) Disconnect the charge set and the gas cylinder, and set the 2-way and 3-way valves to the open position.
- Be sure to use a hexagonal wrench to operate the valve stems.

(7) Mount the valve stem nuts and the service port nut.
- Use torque wrench to tighten the service port nut to a torque of 1.8 kg.m.
- Be sure to check for gas leakage.

*** CAUTION:**
Do not leak the gas in the air during Air Purging.

2) Balance refrigerant of the 2-way, 3-way valves

(Gas leakage)



• Procedure

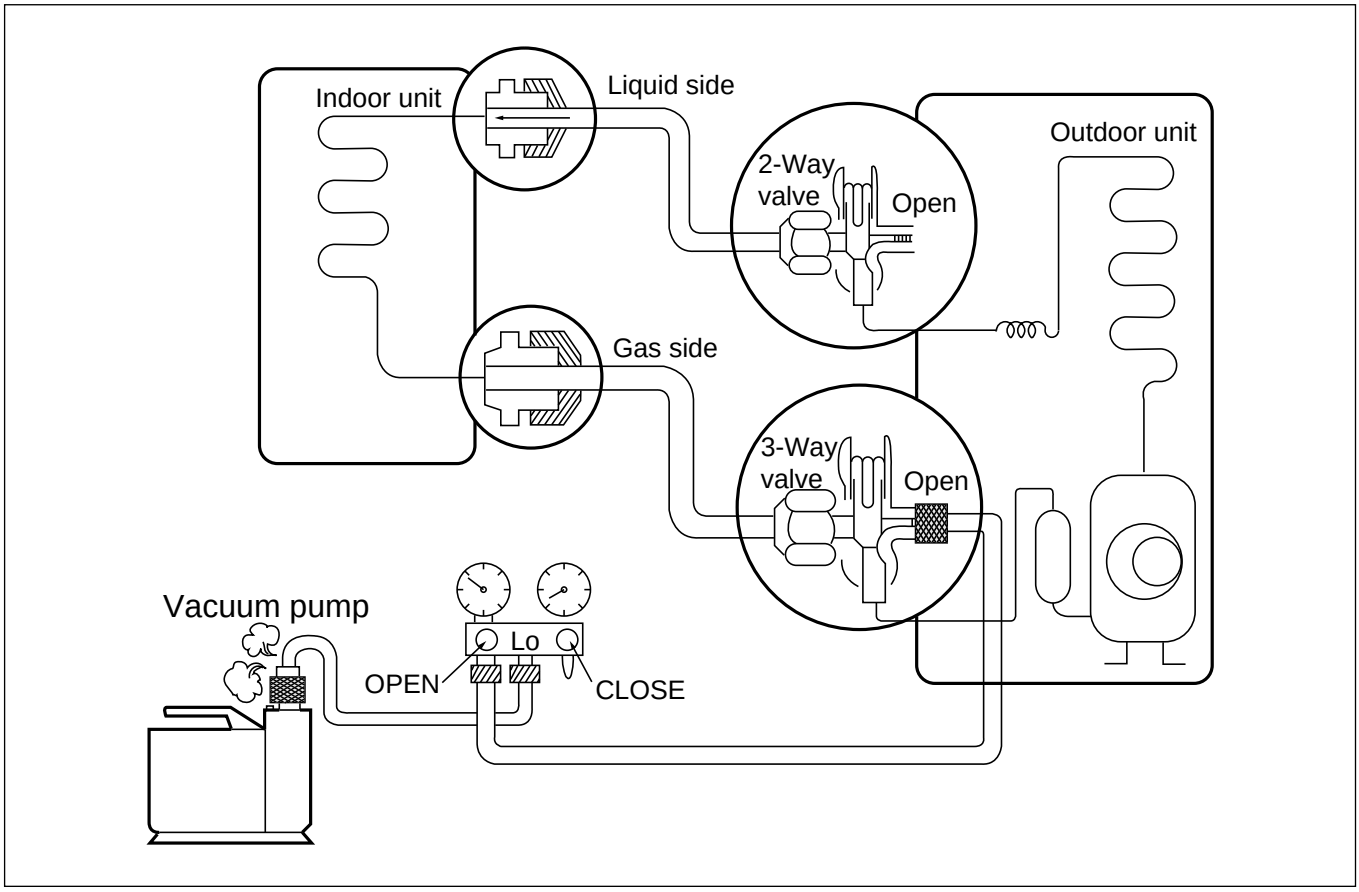
(1) Confirm that both the 2-way and 3-way valves are set to the back seat.

(2) Connect the charge set to the 3-way valve's port.
- – Leave the valve on the charge set closed.
- – Connect the charge hose with the push pin to the service port.

(3) Open the valve (Lo side) on the charge set and discharge the refrigerant until the gauge indicates 0 kg/cm²G.
- – If there is no air in the refrigerant cycle (the pressure when the air conditioner is not running is higher than 1 kg/cm²G), discharge the refrigerant until the gauge indicates 0.5 to 1 kg/cm²G. if this is the case, it will not be necessary to apply a evacuatin.
- – Discharge the refrigerant gradually; if it is discharged too suddenly, the refrigeration oil will also be discharged.

3. Evacuation

(All amount of refrigerant leaked)



• Procedure

(1) Connect the vacuum pump to the charge set's center hose

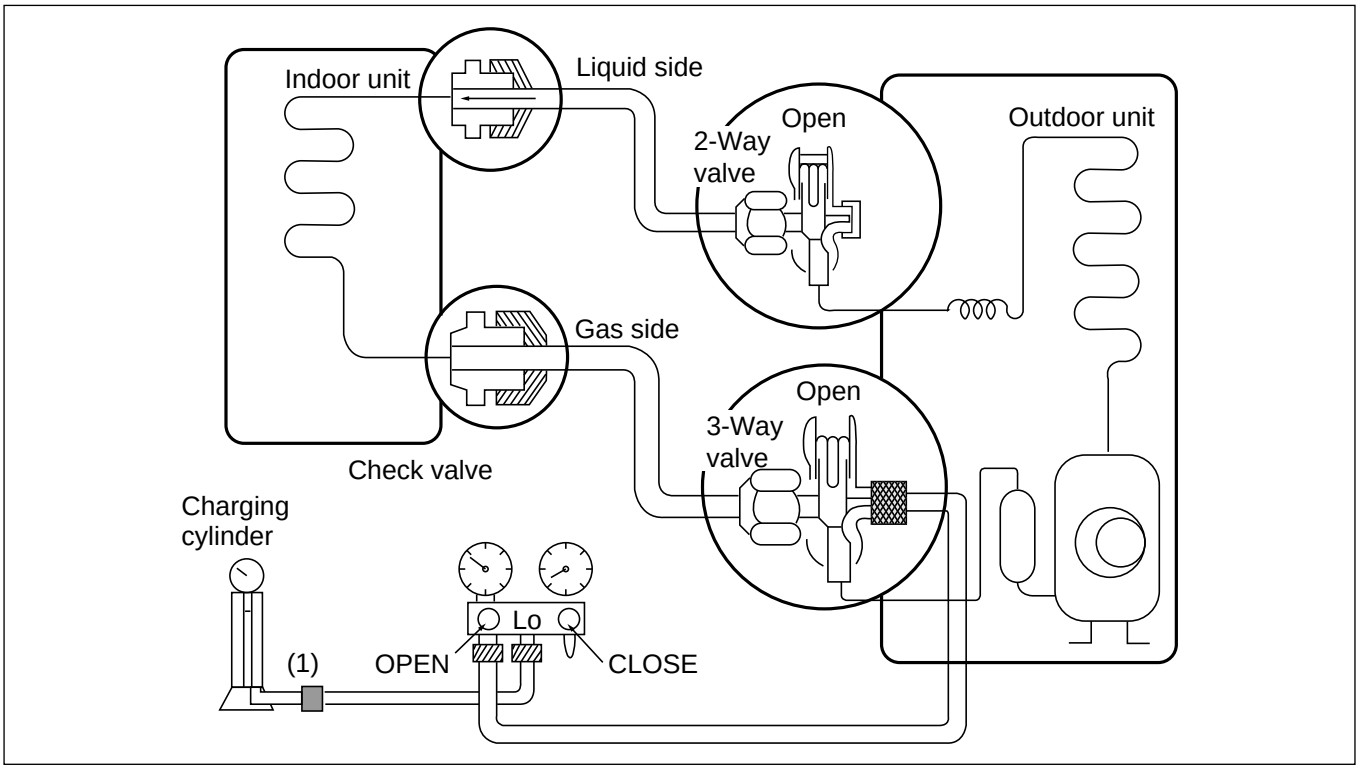
(2) Evacuation for approximately one hour.
– Confirm that the gauge needle has moved toward -76 cmHg (vacuum of 4 mmHg or less).

(3) Close the valve (Lo side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).

(4) Disconnect the charge hose from the vacuum pump.
– Vacuum pump oil.
If the vacuum pump oil becomes dirty or depleted, replenish as needed.

4. Gas Charging

(After Evacuation)



• Procedure

(1) Connect the charge hose to the charging cylinder.
- Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder.
- If you are using a gas cylinder, also use a scale and revers the cylinder so that the system can be charged with liquid.

(2) Purge the air from the charge hose.
- Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air. (Be careful of the liquid refrigerant). The procedure is the same if using a gas cylinder.

(3) Open the valve (Lo side on the charge set and charge the system with liquid refrigerant.
- If the system can not be charged with the specified amount of refrigerant, it can be charged with a little at a time (approximately 150g each time) while operating the air conditioner in the cooling cycle; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure (pumping down-pin).

This is different from previous procedures.
Because you are charging with liquid refrigerant from the gas side, absolutely do not attempt to charge with larger amounts of liquid refrigerant while operating the air conditioner.

(4) Immediately disconnect the charge hose from the 3-way valve's service port.
- Stopping partway will allow the gas to be discharged.
- If the system has been charged with liquid refrigerant while operating the air conditioner turn off the air conditioner before disconnecting the hose.

(5) Mount the valve stem nuts and the service port nut.
- Use torque wrench to tighten the service port nut to a torque of 1.8 kg.m.
- Be sure to check for gas leakage.